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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Death in the First Month and the First Year. By Prof. CHARLES MCNEIL, F.R.C.P.E. IV—Towards Better Control (*with chart*) 993

Interstitial Emphysema and Pneumothorax after Operations on the Neck. By H. J. BARRIE, B.M. 996

Antiserum and Sulphapyridine in Meningococcal Infections in Mice. By C. RUSSELL AMIES, M.D. 999

Atropine and Ergotoxin as Antidotes to Scorpion Toxin. By ALI HASSAN, M.D., and AHMED HASSAN MOHAMMED, M.Sc. 1001

Autograft of Amputated Digit: a Suggested Operation. By Sir HAROLD GILLIES, F.R.C.S. (*illus.*) 1002

The Concussional and Post-concussional Syndromes. By C. T. VAN VALKENBURG, M.D. ... 1003

Radiological Demonstration of Adenoids. By G. T. CALTHROF, M.D., D.M.R.E. (*illus.*)..... 1005

Purpura Hæmorrhagica after Arsenic Therapy treated with Vitamin P. By D. ROBERTSON GORRIE, M.B. 1005

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE: Section of Epidemiology and State Medicine: Clinical Teaching of Social Medicine 1007

PADDINGTON MEDICAL SOCIETY: Epidemics in War-time 1008

BRITISH PSYCHOLOGICAL SOCIETY: Anorexia Nervosa..... 1009

THE LANCET 100 Years Ago 1022

LEADING ARTICLES

TWO WAYS 1013

HOMŒOPATHY INVITES CRITICISM 1014

PLANTS WITHOUT SOIL... 1015

ANNOTATIONS

Serum in Cerebrospinal Fever 1016

Pulmonary Arterial Pressure 1016

The Dysentery Bacilli ... 1016

Yeasts on the Brain 1017

India as a Source of Drug Supplies 1017

Citrated Plasma in Secondary Shock 1018

REVIEWS OF BOOKS

Clinical Practice in Infectious Diseases. By E. H. R. Harries, M.R.C.P., and M. Mitman, M.R.C.P..... 1011

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WOUND INFECTION

VI—Surgery of Infected Wounds. By W. H. OGILVIE, F.R.C.S. (*concluded*)..... 1019

SPECIAL ARTICLES

With the B.E.F. 1031

General Medical Council—Presidential Address .. 1021

Medicine and the Law: Cash Value of Lost Lives 1022

Addendum to the B.P.... 1022

IN ENGLAND NOW

Commentary from our Peripatetic Correspondents 1025

LETTERS TO THE EDITOR

Reading Matter for the Forces (Sir Herbert Creedy) 1027

Blood-transfusion Services (Dr. S. C. Dyke) 1027

Supply and Demand (Dr. W. Annandale Troup) . 1028

Refugee Doctors 1028

Posterior-Pituitary Extract (Miss Elured Williams) 1028

Ozone Treatment of Wounds (Mr. J. R. Quain) 1028

PARLIAMENT

On the Floor of the House 1023

From the Press Gallery: Colonial Development . 1023

Question Time: R.A.M.C. Officers and Private Practice — Tuberculosis in England and Wales —Soldier's Death after Inoculation — Recruits and Mental Instability —Biological Science and Camouflage—No Badge for Physical Rejects—Evacuation of Adult Invalids—Compensation for Air-raid Injuries ... 1024

OBITUARY

Herbert John Paterson, F.R.C.S. (*with portrait*).. 1030

Isaac Flack, L.R.C.P.E. 1030

MEDICAL NEWS

University of Cambridge 1029

Society of Apothecaries of London 1029

British Pharmaceutical Conference 1029

South African Institute for Medical Research .. 1029

Colonial Medical Service 1029

Coöperation in Scottish Hospitals 1029

V.D. Centres for Seamen 1029

Royal Sanitary Institute 1029

Society for Relief of Widows and Orphans of Medical Men 1029

Mobility of Civil Nursing Reserve 1029

NOTICES

Surgery of the Colon 1032

Natives in British North Borneo 1032

Russia's Millions 1032

Bilirubin in Urine 1032

Bleach Ointment 1032

Less Sugar for Medicines 1033

"Furbie" 1033

Synthetic Bristles 1033

Alchemy 1033

A Doctor in the Sudan .. 1033

New Preparations: Synthovo (Hexœstrol) — Bromethol (Boots) — Hexanstab — Flavotan — Eptoin — Soneryl — Hexobarbitone — Aminophylline — "Hypoloid" Mersalyl — Derobin 1033

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ADDRESSES AND ORIGINAL ARTICLES

DEATH IN THE FIRST MONTH AND THE FIRST YEAR

BY CHARLES MCNEIL, M.D. Edin., F.R.C.P.E., F.R.S.E.

EDWARD CLARK PROFESSOR IN CHILD LIFE AND HEALTH IN THE UNIVERSITY OF EDINBURGH

IV—Towards Better Control

IN the three preceding papers I have dealt with the causes of death in the first month and the first year of life, and have sketched in a general way defects in our medical and nursing organisation for this period. In this concluding paper I shall summarise briefly what has been said about causes of death, make some definite statements about the faults in our medical and nursing control, and finally make concrete proposals for improvement in our control.

CAUSES OF DEATH IN THE FIRST MONTH AND THE FIRST YEAR

This can only be a general survey of an immense and complicated problem of which our present knowledge is imperfect. These causes may operate before, or during, or after birth; they may be predisposing or immediate. More than one cause may be present—for example, prematurity predisposes to intracranial hæmorrhage, and hæmorrhage may be combined with infection.

Stillbirths and the early neonatal deaths form one great group, with similar predisposing conditions and similar immediate causes.

Prematurity (or immaturity) is an important predisposing condition in stillbirths, in early and later neonatal deaths, and in deaths after the first month. The premature baby is much more liable to intracranial hæmorrhage and is equally liable to earlier and later postnatal infection. If we could control prematurity, we would greatly reduce the infant death-rate. Before we can do that, we must know much more about its causes; this is one of the major problems that require further thorough investigation.

Intracranial hæmorrhage.—In the autopsy series given in the first paper, intracranial hæmorrhage formed a third of the immediate causes of neonatal deaths. Its importance needs no further emphasis; here also research into the predisposing conditions, both antenatal and natal, is needed. Other forms of fatal hæmorrhage may be included—e.g., into the lungs or the abdomen.

Asphyxia is another of the big factors, both in its grosser forms actually causing death and in its minor degrees favouring other factors. Treatment has been improved by more knowledge of the complicated mechanism of respiration. The part played by anæsthetics, analgesics, and other drugs is still uncertain; attention is being paid to these factors at the present time.

Congenital defects form a group which is not negligible but in the present state of knowledge is beyond control. And with this group may be taken that of miscellaneous conditions—hæmorrhagic disease of the newborn, icterus gravis, renal thrombosis, and shock.

Infections.—Antenatal and natal infections occur; but of much greater importance are postnatal infections; these fall into two groups:—

(1) The first occurs soon after birth when natural immunity is weak and when pneumonia, meningitis, and septicæmia can easily develop if a strict nursing routine is not maintained. The prevalence of these early postnatal infections probably varies a good deal; in the first paper it was shown to play a large part in the aggregate of autopsies; but its extent can only be gauged when autopsies are carried out. But it is not enough to know that death has been caused by bacterial invasion of the lungs, the meninges, and the brain. We need to know, and as yet we do not know, by what channels these bacteria enter the body, and from what sources—e.g., food, air, attendants—they come. When we have certain knowledge of the sources and channels of infection, it will probably be easy to create the technique of defence. And among the infections, thrush must be included; it certainly plays a part in fatal neonatal infection.

(2) The second group of postnatal infections come into play after the first fortnight of life and continue throughout the first year of life and later. In this group the two great infections are gastro-enteritis and pneumonia. In all countries gastro-enteritis has been greatly reduced in the last forty years. To this end the motor-car has been a great blessing in removing the horse and the stable from the towns; we have also learnt how to give clean milk to infants. But in our country respiratory infection still takes a heavy toll of infant and child life. Not one, but many factors contribute to this. In the second paper the importance of malnutrition, as one of these factors, has been emphasised—disturbed nutrition produced by mismanagement of feeding, especially of breast-feeding, in the first month of life, lowering the resistance to every kind of infection.

This catalogue of the causes of death from birth to the end of the first year shows how formidable and complex is the problem we are dealing with. In the third paper I have given figures of infant death-rates of our own and of other countries. These figures show that our country as a whole has a much heavier wastage of infant lives. Comparison between one country and another in these matters is subject to allowance for many varying factors, such as climate, housing, and poverty; and strict comparison is hardly possible. But, even if fair allowance could be made for these local variations, we cannot escape the conclusion that the high infant death-rate in Britain is largely due to defects in our medical and nursing control after birth.

PRESENT MEDICAL AND NURSING CONTROL

So far as obstetrical control is concerned, we have little to fear in comparison with that of other countries. Here obstetrics and gynæcology form a completely organised and integrated service, much more so than the other great clinical subjects which make up the material of medical practice—medicine, pædiatrics, surgery. Obstetrics and gynæcology in their teaching provide a thorough grounding in anatomy and physiology; and in Britain they have developed the preventive side of the subject in their antenatal clinics to a greater extent than in most other countries. They have also provided a well-trained nursing service and are at the moment extending the training of midwives.

Pædiatrics is moving towards this standard but is still far short of it. The subject, diseases of children (or disease in childhood), takes a larger place in the medical curriculum than it used to do; but it is still too small, when the important place of the subject in medical practice is considered. More important, the subject is neglected in the professional examinations. In how many medical schools is there carried out the recommendation of the General Medical Council of a test of the candidate's knowledge of disease in children and infant hygiene by the teachers of those subjects? Infant hygiene means the protection of infant health and includes the dietetics of infancy and the healthy regulation of its environment. This subject cannot be taught thoroughly at a children's hospital but only at pædiatric clinics attached to maternity hospitals where is available the clinical material of the newborn in the nurseries and the older babies attending the hospital welfare clinics. A little clinical teaching of infant care and dietetics at maternity hospitals is being given here and there; it is at least a move

in the right direction; it can and ought to be extended. It is only in such clinics that the future family doctors can be trained to deal efficiently with breast-feeding, bottle-feeding, and all the other factors that maintain health in infancy.

Child-welfare service.—So much for teaching, which is fairly adequate as regards disease in children but is quite inadequate as regards health. Consider next the preventive branch of pædiatric practice, corresponding to the antenatal service in obstetrics. Here we have the special health services of school inspection and child welfare. Let us deal only with the child-welfare service, which bears upon our subject of infant health. Entrance to the child-welfare service is secured by the Diploma of Public Health given in the medical schools. The teaching courses for the D.P.H. give a sound training for the work of a medical officer of health, but their training in the work of a child-welfare officer is lamentably scanty. The child-welfare medical officers take up their duties with little more knowledge of infant hygiene than that given to them as medical students; and we have seen how inadequate this is. They are left to learn their subject as they go along; but they have not had a thorough graduation in it at any medical school.

The *nursing service of child welfare* is provided by health visitors or by district nurses holding that certificate. In their short training course of six months, pupil health visitors are taught many things besides infant hygiene, but they do not receive a concentrated thorough clinical training in infant dietetics; and yet, in their practice, that is the subject in which, if properly trained, they might do their most valuable work. In her practice, the great potential value of the health visitor is not realised because of inadequate training. Her training cannot compare in thoroughness with that given to the health nurses of Australia, New Zealand, Holland, and the great towns of U.S.A.

Another serious defect in our health nursing service is the change-over in the critical first month of life from the home midwife or the maternity-hospital nurse to the health visitor. This change and gap in nursing control is often the cause of unnecessary weaning and spells disaster to the baby. In some areas medical officers of health, appreciating this defect, have made special provision for the attendance of health visitors in the first week of life; but this is not the general rule.

The child-welfare service might be described as semi-detached. It tends to work apart from the family practitioner, who often finds himself ousted from his supervision of the baby. Its liaison also with the children's hospitals is weak. The degree of detachment varies in different areas; but, on the whole, the service tends to revolve in an orbit of its own, separated from general medical practice and from the hospitals and medical schools. In too many cases the child-welfare medical officers, giving excellent service to the community, live in professional isolation and spend their lives in a monotonous treadmill of baby clinics.

This list of defects is offered for discussion; and discussion may show some of them to be overstated or incorrect. The child-welfare service is little more than twenty years old, and the broad lines of its organisation are sound. If these alleged faults are genuine, the blame cannot be put upon the medical and nursing personnel of the service; nor upon the medical officers of health who direct the work; nor indeed upon the Government departments of health. The root cause of these defects is the poor training on infant dietetics and hygiene given to the nurses and doctors of the child-welfare service in our medical schools and hospitals. The removal of town children to the country last autumn, showing the low level of cleanness in many of our city homes, and the high infant death-rates in most of our large towns are accusing facts. They are blots on our social and our medical prestige, which have disturbed the medical profession and the general public. The new medicine of health can make some contribution even to the social side of the problem; and it can surely provide a more effective medical control of our heavy loss of life in the first year.

BETTER CONTROL

As regards the sick child, the material of study and of teaching is provided in the children's hospitals. The problem of health in infancy and childhood, if it is to become an applied science, also must have its material of study, its clinical material of healthy babies followed from birth through childhood. Where can this material be found in a form suitable for study and teaching, so that the science of child health can be applied in practice in the homes of the people? Only in a maternity hospital where students and nurses are taught, with modern equipment for pathological and physiological investigations, with an adequate clinical and scientific staff, and with a child-welfare clinic attached, so that the baby can be kept under continued observation. The problem of health in childhood is not a simple affair and certainly not an automatic process which solves itself. Health is wholeness or integrity of life, the life of the soma and of psyche also. The problem of health in the child is immense and complicated; it is one of the major problems in the world of human society; and it is one to which medicine can make a great contribution. As yet only a beginning has been made, but the approach to the problem of study and teaching has been made in the right place—the nurseries and follow-up infant clinics of maternity hospitals. It is by the furtherance of pædiatric study and pædiatric teaching at maternity hospitals that we can win and disseminate fuller knowledge of infant and child health.

Maternity-hospital pædiatric unit.—The pædiatric service at maternity hospitals needs to be extended and strengthened both on its clinical and scientific side. At present in most hospitals the staff consists of one pædiatrician with perhaps an assistant. Such a staff can do little more than deal with cases of illness, supervise the nursing routine, and keep a register of deaths. It is important that some kind of clinical record should be kept of every baby; and each maternity hospital has its own type of baby chart. The first fortnight of life is crowded with events, physiological as well as pathological, and the baby chart should be so planned as to include a record of these and of relevant data of the labour and pregnancy. With a small staff and many cases the keeping of good records can be made easier by the use of abbreviations and symbols. Fig. 6 shows a chart based on that used in the Edinburgh Maternity Hospital. These symbols have been of great use in allowing a full record to be made with the minimum of trouble, in giving the pædiatrician and obstetrician a clear and full *picture* of the clinical story, and in training the nursing staff in clinical observation. A good neonatal record is also invaluable when the baby returns for supervision at the infant clinic. The maternity hospital has the complete charge of the baby for the first two weeks, and in a few cases for longer. But these two weeks are crowded with cases of fatal and non-fatal illness; and even health is then a doubtful equilibrium and requires close observation. Under these conditions good records are essential for an efficient clinical routine; and, if to this routine are added research and teaching, not only is a strong clinical staff required, but there must be as well a pathologist and bacteriologist and a secretary to index and file records. And if, as is now the case at most maternity teaching hospitals, an outpatient baby clinic is attached, the need for strengthening the pædiatric staff is still stronger. The first month and the first year of life form a great field for research and for teaching, a field which ought to yield a rich harvest of life-saving knowledge; but it can only be made to do so by the labour of research and of teaching.

Maternity-hospital training school in infant care and dietetics.—It will be agreed that all whose work is the protection of infant health—doctors in family practice and the child-welfare service and nurses—should be well trained. The complete clinical material for

FIG. 6

BABY CHART: THE FIRST MONTH

Name BABY X.Z. *Sex* m. *Address* 9 Y. STREET, EDINBURGH

PREGNANCY:—No: 3 *Mother's Age* 29 *Illness* PRE-ECLAMPTIC TOXAEMIA – SEVERE.

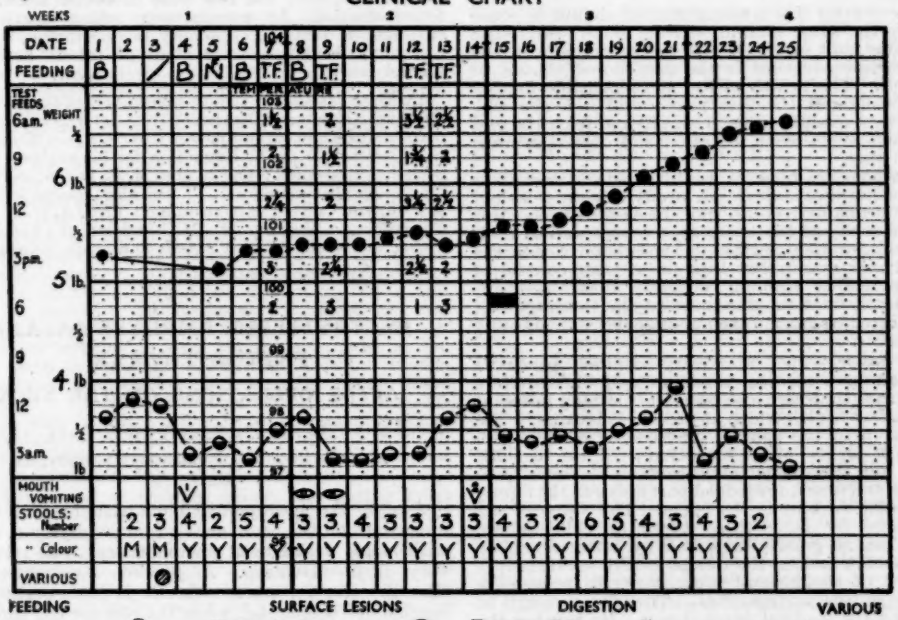
Previous Pregnancies:— ♀ ♂ ○ ○ ○ ○ ○ ○ ○ *PUERPERIUM:* RAPID RECOVERY.

LABOUR:—Presentation VERTEX R.O.A. *Character* MID-CAVITY FORCEPS. *Duration* 13 43/60 hours.

INFANT:—Condition at Birth SHOCKED – ASPHYXIA PALLIDA. *Maturity* ? 36 weeks.

Birthday 1st November, 1939.

CLINICAL CHART



FEEDING

Breast-Feeding . . . B
" " Test feed . T.F
" " Supplemented . B
Bottle-Feeding (Cow's Milk)
" " Fresh . . Af.
" " Condensed . Ac.
" " Dried . . Ad
Nipple, Retracted, Fissured . N, N

SURFACE LESIONS

Mouth, thrush . . . .
Eyes, catarrh —right, left
Nose, " . . . .
Ears—right, left . . .
Skin . . . . .
Umbilicus . . . .
Jaundice . . . . J

DIGESTION

Vomiting, slight . . V
" definite . . V
" blood . . V
Bowels, diarrhœa . . A
" constipation . A
" blood . . A

VARIOUS

Convulsions, major . . .
" minor . . .
Cough . . . . .
Colour Change (cyanosis) . .
Previous Pregnancies, miscarriage .
" " stillbirth . ♂ ♀
" " postnatal death . ♂ ♀
" " alive . . ♂ ♀

Clinical Notes, and Directions for Use of Chart, on the back.

Weight . . . . . ●
Temperature . . . . . ○
Separation of Cord . . ▬

teaching them is to be found at maternity hospitals. It is there that training schools in infant care and dietetics should be established. Research goes hand in hand with teaching. But for our present evils teaching offers the more immediate remedy; and I shall now make suggestions about the way in which the remedy of teaching may be applied.

These papers have discussed the infant death-rates in the first month and the first year. Everyone agrees that these deaths can be controlled more effectively by the prevention of the diseases that cause them, than by their cure: this is true both of the deaths in the first month and of those in the later months. The early neonatal deaths from prematurity, hæmorrhage, and asphyxia are hard to reduce but are being dealt with by a well-trained and organised obstetric service. The nearly neonatal deaths from infection can be reduced by a stricter nursing technique in the first week or two after birth. Our infant death-rates in the first fortnight after birth are as low as those of other countries and testify to the efficiency of our obstetric service. But after the first fortnight our infant wastage continues to be heavy, while that in Holland, Australia, New Zealand, and U.S.A. rapidly falls off. The claim has been made in the second paper that this is largely due to the mismanagement of feeding, especially of breast-feeding, in the first month. If this is true, heavy loss of infant lives after the first fortnight can be reduced by giving to all doctors and nurses in charge of infants thorough instruction in the dietetics of the first month. Breast-feeding and bottle-feeding in the first month must therefore be the principal subject in the training of all who are concerned with child welfare. If sound digestion and good nutrition can be established in the first month, the baby is given its best defence against later infections.

The nurse.—Not merely by courtesy but also because of the more important part played by the nurse in infant health, the training of the nurse will be

considered first. Our nursing service of health visitors can best learn the theory and management of breast-feeding (and of bottle-feeding) at maternity hospitals, where they can be taught the process at its very beginning in the nurseries and its early difficulties in the follow-up baby clinic. This can be done without any change of policy but by arrangement between the authorities of the medical schools and hospitals and the Departments of Health. This change in teaching would make a great improvement in nursing practice. The health visitor, well trained in dietetics and in the other points of infant care, should herself manage these problems of normal dieting, and should do so in the home.

It is essential that nursing control should be exercised by the same individual from birth; and that the vicious fault of transfer from the midwife to the health visitor sometime in the first month should be abolished. The health visitor is responsible for the baby throughout the first year; and it is she who should be in charge, either from birth or from the end of the first week, when lactation and digestion come into full play.

The whole training of health visitors and their previous hospital experience needs drastic revision; this will probably have to wait for easier times. But a careful study of the training of nurses and of their use in child-welfare service in those countries in the old and new world that lead us in their control of infant mortality strongly suggests that these low infant death-rates are due more to the thorough and concentrated training of the nursing service than to any other factor.

The doctor.—The maternity-hospital pædiatric clinic can give medical students and child-welfare doctors that thorough and practical training in infant dietetics and health which at present is lacking. The part played by the general practitioner in child-welfare work is too often forgotten; of the benefits claimed for the official child-welfare service a considerable and unacknowledged part is due to the family practitioner working in the home. The value of the work done by both these types of child-welfare doctors can be greatly increased by better teaching. It is common talk in the official health services that the work of the general practitioner in preventive medicine is passing from him. That forecast will be settled by the medical practitioner. He touches the problem of infant and child health at its centre—in the home where the battle of health is fought, and won or lost. If he is taught in his medical school something of that physiology which is infant health, especially about infant feeding, digestion, and nutrition, the family doctor, practising in the home what he has been taught, can make a more powerful contribution to the problem than can the doctor in the clinic. It will be a disaster if this contribution is weakened by poor training or by the encroachment of the official child-welfare service. The medical profession may be trusted in this to safeguard its own interest and the welfare of the child.

Some remarks may be made about the direction of this trained health service of nurses and doctors in their practice. There should be a change in direction. The nurses should be in the first line; the doctor should be in support. The centre of action should be in the home; the clinic should be subsidiary. This is a double shift of emphasis, from the doctor to the nurse, and from the clinic to the home. There should be a concentration upon breast-feeding, and a special effort should be made to overcome difficulties, thus ensuring at once good nutrition and the best defence againt disease. These are the hallmarks of the infant-health service in those other countries that have gone far beyond us in their reduction of the infant death-rate.

Dr. J. S. Fairbairn* has urged for years a policy of coöperation in the protection of health of the mother and the child—a policy to be worked out in maternity hospitals, beginning in the antenatal clinic and ending in the infant and child clinic, and accompanied by a combined course of teaching of what he has called constructive physiology. This is no castle in the air. The fabric of the policy is already provided by the organisation of our maternity hospitals; and its maternal side is now well developed. It remains to develop and link up the study and teaching of health problems in the child; and we have hardly begun this immense task. In the whole plan of child health the first month of life is of great strategical importance. If we can bring death and disease in the first month under more effective control, this mastery will show itself throughout the first year in better health and fewer deaths. At present our infant death-rates throughout Britain, especially in our towns, are far too high, because our control of infant health is second-rate.

* Fairbairn, J. S. *Lancet*, 1927, **2**, 163, and *Edinb. med. J.* 1935, (transactions) p. 63.

I wish to express my thanks to members of the pædiatric unit of the Edinburgh Maternity Hospital who have helped in the preparation of these papers; to Dr. Agnes Macgregor, pathologist; Dr. J. L. Henderson for his analysis of the pathological records; and to Miss M. E. Dixon, secretary, for the graphs and figures. I am also greatly indebted to Prof. van Creveld of Amsterdam; Prof. A. Wallgren of Gothenburg; and Dr. H. M. Bundesen of Chicago for giving me recent verified figures and other information.

INTERSTITIAL EMPHYSEMA AND PNEUMOTHORAX

AFTER OPERATIONS ON THE NECK

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AMONG the postoperative catastrophes following operations on the neck mediastinal emphysema, often with single or bilateral pneumothorax, has received very little attention. A possible explanation is that the test for pneumothorax is often omitted in routine necropsies and, when the ribs are cut through with a knife, the strong downward pressure masks the rush of air that may take place when the pleural cavity is opened.

This test for pneumothorax is a routine at the London Hospital. After median incision the skin and pectorals are stripped away from the chest wall in one flap. Each gutter so formed is filled with water, and a narrow bladed knife is plunged through the water into the pleural cavity. The blade is rotated to enlarge the opening, and air, if present, bubbles out through the water.

The most probable fate of such cases is that they are pigeon-holed with the uneasy group of massive collapse of the lungs. The distinction during life is a very practical one; for, if the proper negative pressure in the thorax could be restored, death might be prevented. The following four cases illustrate this condition. In three the operation was partial thyroidectomy. I saw the first two in the post-mortem room and found the third in the records of the Institute of Pathology of the London Hospital. In the fourth the operation was tracheotomy for œdema of the glottis. In a fifth case (not reported here, because necropsy was refused) the patient had shock and cyanosis after partial thyroidectomy. The next morning she had greatly improved. Oxygen was given for residual cyanosis. Twenty-two hours after the operation she suddenly collapsed, with symptoms of obstructed respiration, and died within two minutes.

CASE-RECORDS

CASE 1.—Female, aged 42, with loss of weight and symptoms of hyperthyroidism for a year.

Operation.—Partial thyroidectomy. Avertin was given in the ward and no atropine. In the theatre an attempt was made to introduce an intratracheal tube; this produced coughing, with excess mucus and cyanosis. Atropine gr. 1/75 was then given, and then open ether, with a change to gas and oxygen as soon as the patient was under. Ten minutes after the start of the operation and before the hyoid muscles had been divided the patient became cyanosed and stopped breathing. She improved and was again given open ether but never regained her proper colour. Nine hours later, in the ward, she suddenly became dark blue and died.

Post-mortem findings.—A stout woman with recent sutured semicircular incision on the lower part of the neck. Deep cyanosis of face. Puffiness from subcutaneous emphysema of the face, especially round the left eye. The thyroid has been removed except for the posterior borders on each side, which consist of bars 4 × 1 × 1 cm. Bed dry and clean. Field of operation separated from the cupula of the pleura on each side by an intact layer of fascia. The only place where the fascia is loosely disposed and appears to provide access to the thoracic cavity is round the innominate artery. Considerable interstitial emphysema of the tissues round the field of operation and in the anterior mediastinum. Pericardium and mediastinal pleura in places lifted up by bullæ of air. Air under pressure in both pleural sacs, more in the right than in the left. Abundant tenacious mucus throughout the trachea and bronchi. Both lungs collapsed; the right contains no air, and the left only a little in the upper lobe and anterior borders. Apart from this the parenchyma appears normal. There is diffuse lymphatic hyperplasia but no other notable changes in the remaining organs.

Experimental procedures.—With the corpse lying head downwards the cupulæ of the pleura were filled with a solution of methylene blue, and there was no leakage of the solution into the neck. Removal of the lungs had so damaged the mediastinal pleura that a similar test was not possible in the middle line. With the lungs under water, air was introduced under pressure, first into each main branch of the pulmonary artery, and then into the bronchi. No air escaped, except from a small area at the reflexion of the pulmonary ligament, where the underlying lung parenchyma had been injured during removal.

CASE 2.—Female, aged 53, with nodular enlargement of the right lobe of the thyroid and symptoms of hyperthyroidism. The left lobe had been removed some four years previously.

Operation.—Removal of nine-tenths of right lobe and isthmus. The left lobe was absent. A sucking noise was heard during the operation; so the right internal jugular vein was tied. Omnopon and scopolamine anæsthesia. Local infiltration with Procaine and adrenaline. Gas and oxygen. There were no symptoms of obstructed respiration during the operation. At 6 A.M. the next morning the patient became very blue, gasped, and died.

Post-mortem findings.—A fat muscular woman. Dry cavity at site of right lobe of thyroid with tube leading out through transverse incision. Considerable emphysema of connective tissue throughout prevertebral tissue of neck, in superior and anterior mediastinum, and in interlobar septa of lungs, but only a few scattered blebs in interlobular septa under the pleura. Strong rush of gas from both pleura in pneumothorax test. Collapse of greater part of left lower lobe, of rather less than half of left upper lobe, of posterior half of right lower lobe, of subpleural zone 1·5 cm. deep over right upper lobe and with œdema of lower posterior and mesial two-thirds of right middle lobe. Acute vesicular emphysema of rest of lungs. No detectable perforation of domes, visceral pleura, or trachea. No tuberculous lesions found in lungs. Bilateral small remnants of largely colloidal and nodular goitre; left remnant bound by dense scar tissue to trachea. Slight subcutaneous emphysema for a distance of only 2 cm. around operation wound. Slight hypertrophy of heart chiefly left ventricle.

CASE 3.—Female, aged 50, with a small lump in the right lobe of the thyroid, associated with three years' breathlessness and palpitations.

Operation.—Partial thyroidectomy. Anæsthetic: Procaine and adrenaline infiltration and then gas and oxygen. Immediately after the intratracheal tube was removed there was deep cyanosis, despite a free upper airway. The tube was replaced, but she still had distress of respiration, and the chest was not moving at all. Retraction of the lower part of the chest. Breathing sounds like asthma. Percussion note resonant. She improved with oxygen. The nasal tube was removed at 11 P.M. At this time the ankle-jerks and knee-jerks were increased, and the chest signs were the same, with distress on respiration. Patient died at 2.50 A.M.

Post-mortem findings.—A wasted edentulous grey-haired woman. Clean collar incision with a tube leading into dry clean cavity on the left side. Phrenic and recurrent nerves on each side free from ligature. Collapse of all lower lobe of left lung, except a few small areas on posterior and mesial aspects. Collapse of lower border of left upper lobe and of posterior two-thirds of right lower lobe, and of a subpleural area in posterior part of lower border of right upper lobe. Considerable alveolar emphysema of rest of lungs. Thick viscid mucopus in bronchioles in the collapsed areas, completely filling the bronchi and forming plugs filling segments of the lumen of the trachea. Collapsed areas in lung dark red, containing a considerable amount of blood. Great distension with gas of superior and anterior mediastinal tissues. Subcutaneous emphysema of lower neck and anterior chest as far down as breasts. Bilateral pneumothorax proved by the water test and by the diaphragm being pushed down like a partly inflated balloon as far as the right sixth and left fifth ribs. No rupture seen between mediastinal tissues and pleural cavities. Glandular thymus. Tonsils enlarged.

CASE 4.—Female, aged 55, underwent tracheotomy for œdema of the glottis.

Post-mortem findings.—Cellulitis of neck extending from small abscesses in connective tissue outside left tonsil. Severe œdema of the glottis. Tracheotomy wound 2 cm. long in right side of the trachea, through fourth to seventh rings. Subcutaneous emphysema of face, eyelids, neck, chest, and axillæ. Bilateral pneumothorax, determined by rush of gas on opening the chest; water test not made. Collapse of greater part of lower lobe of right lung and anterior and lower part of right upper lobe and of right middle lobe. Collapse of left lung, except a few central areas in left upper lobe.

DISCUSSION

The origin of the interstitial emphysema and that of the pneumothorax require elucidation.

Source of interstitial emphysema.—There is no evidence that air escaping into a pleural cavity from a ruptured superficial vesicle of the lung ever gets through intact pleura into the surrounding tissues. Interstitial emphysema besides pneumothorax might possibly result from operative perforation of the cupula of the pleura in thyroidectomy. In cases 1 and 2 the cupula was found at necropsy to be intact. In the necropsies on cases 3 and 4 the cupula is not mentioned, but it is the rule in the summaries of necropsies of the London Hospital to mention lesions and omit negatives. It is, moreover, very unlikely that surgeons as skilled as those who operated would damage the pleura without knowing it. There can be little doubt that the interstitial emphysema was caused either by air being drawn into the wound by

the suction of the thoracic pump or by air from a ruptured vesicle of the lung entering the pulmonary interstitial tissue and extending thence into the mediastinum. Pulmonary interstitial emphysema often follows obstruction of respiration, as in bronchopneumonia, diphtheria, and asthma. Obstructed respiration was an outstanding feature in cases 1, 3, and 4, and in the fifth case mentioned the right recurrent nerve was compressed with forceps. In these cases no pulmonary interstitial emphysema was observed at necropsy, though in case 3 there was considerable alveolar emphysema of the parts that were not collapsed. In case 2, in whom there was no sign of obstruction of respiration during the operation, pulmonary interstitial emphysema was observed at necropsy, but it could have extended from the mediastinum. A sucking noise heard during operation makes it virtually certain that the wound was the site of entry of air. The distribution of the subcutaneous emphysema in cases 1, 2, 3, and 4 suggests that it was spreading from the wound. In none of the cases was there any evidence of rupture of a pulmonary vesicle into the interstitial tissue. There can be little doubt that the air entered through the operation wound in most, if not all, cases.

Source of pneumothorax.—Reasons against damage to the cupula have been given above. Pneumothorax might result from pulmonary interstitial emphysema. Macklin (1937) has produced mediastinal emphysema and bilateral pneumothorax by experimental localised over-inflation of the lung. As mentioned above, however, there is no certain evidence that pulmonary interstitial emphysema was the source of the air in my four cases on which there were necropsies. Also, in Macklin's experiments the pneumothorax was bilateral and could not, therefore, be attributed directly to the pulmonary interstitial emphysema of the inflated lung. There can be no doubt that the bilateral pneumothorax was directly due to the mediastinal emphysema in his experiments. Keis (1934) collected seven cases, all fatal, of mediastinal emphysema following thyroidectomy. Four had bilateral pneumothorax also. In two cases mediastinal emphysema was observed during the operation. He inflated the mediastinum of a corpse and produced pneumothorax. I have repeated his experiments and found that, if the mediastinum is inflated with even moderate pressures, the mediastinal pleura is lifted up, small blebs form within it, and air percolates into the pleural cavity. The process can be watched best by removing part of the lateral chest wall and filling the pleural cavity with water. The air usually escapes first just above the hilum of the left lung. Watching the air infiltrating through the tissue planes I got the impression that it infiltrates through the connective tissue and passes along under the pleura until it reaches a weak spot, where it then passes through. It can be concluded, therefore, that in such cases the pneumothorax is caused by rupture of air from the mediastinum, whether the port of entry of the interstitial emphysema be the wound or the lung.

In all cases death was sudden, even although cyanosis had existed. This may be explained either by a stage being reached when the compensatory respiratory movements were rendered inadequate by the mounting pressure within both thoracic cavities, or by a pneumothorax of one cavity being suddenly followed by that of the other. It is surprising that with the powerful suction exerted by the thorax air does not enter into the mediastinum more often during operations on the neck. It may enter more often than has been recognised, because a small amount may be symptomless. For great and extensive interstitial emphysema, obstruction of respiration is undoubtedly an important factor, as Keis emphasised. The dyspnœa causes the chest movements to be more powerful. In thyroid operations intubation, formation of mucus, œdema, pressure by goitre, and surgical interference with the recurrent nerves are all possible causes of dyspnœa. In case 1 respiration was obstructed even before the operation, and the attempts at anæsthesia were a series of catastrophes. In case 3 respiration was almost completely obstructed whenever the tube was removed. In the fifth case mentioned a note was made during the operation that the right recurrent laryngeal nerve was found to be grasped in artery forceps.

Diagnosis in these cases should be easy. During or soon after operation the patient becomes cyanosed and dyspnœic. This may be associated with obstructed respiration, but, when the obstruction is relieved, the cyanosis remains, though it may not be quite so deep. The heart may not be displaced, for the pneumothorax may be bilateral. None of the case-records mention any signs that might be characteristic of mediastinal emphysema, but the houseman (Mr. F. K. S. Hirschfeld) diagnosed the pneumothorax in case 3 before death. The diagnosis should be most easily confirmed by inserting a needle into the pleural cavity with one end attached by a short length of tubing to a mercury or water manometer, and by noting the existence of a decreased negative, or even a positive, intrapleural pressure.

Treatment.—We have not had the opportunity of trying the effect of treatment on any of these cases. Three lines suggest themselves:—

(1) Removal of air from the pleural cavities. Relief could be obtained by draining out some of the air with a needle inserted between the ribs. The rationale of this method lies in the fact that the opening in the pleura from the mediastinum is almost certainly valvular, and so the air accumulates in the pleural cavities under pressure. If a pneumothorax apparatus or vacuum bottle is available, it might be possible to go further and restore the negative intrathoracic pressures. It should be remembered that the pneumothorax is most likely bilateral, and that in this case constant suction with a Roberts bottle on one side is essential if an under-water drain is being used on the other side.

(2) Removal of the obstruction of respiration, if any exists.

(3) Prevention of entry of any free air into the deep tissues of the neck. In the case of thyroidectomy wounds any tube drain should be removed and the wound closed.

SUMMARY

Four proved cases of death from interstitial emphysema with bilateral pneumothorax, three following partial thyroidectomy and one tracheotomy, are described and discussed. A fifth case, after partial thyroidectomy, is also mentioned, but there was no necropsy.

It is concluded that the air entered the tissues from the wound rather than from the lung and never from a damaged pleural cupula, while the air entered the pleural cavities from the emphysematous mediastinum.

My thanks are due to Prof. H. M. Turnbull for permission to make use of the records of the Bernhard Baron Institute of Pathology for cases 2, 3, and 4 and for his valuable assistance.

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ANTISERUM AND SULPHAPYRIDINE IN MENINGOCOCCAL INFECTIONS IN MICE

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THE spectacular results of using sulphonamides in cerebrospinal meningitis are founded on laboratory studies of experimental meningococcal infection of mice.

Buttle, Gray, and Stephenson (1936) showed that *p*-aminobenzenesulphonamide (sulphanilamide) would protect mice against experimentally induced meningococcal septicæmia. Proom (1937) demonstrated that this preparation was effective when given by mouth, and that it could protect against a million fatal doses of meningococci, provided that the administration of the drug was begun immediately after the inoculation of the organisms. When treatment was delayed for several hours, however, much less protection was obtained.

In the treatment of an established infection in mice both Branham and Rosenthal (1937) and Brown (1937) reported that the combined administration of sulphanilamide and antimeningococcal serum gave better results than either drug or serum alone.

Cerebrospinal fever in man was at first treated with the drug and the serum, and the results were far beyond expectation (McIntosh, Wilcox, and Wright 1937, Mitchell and Trachsler 1937, Jewesbury 1938). Successful results obtained with sulphonamides without serum were later reported by Schwentker, Gelman, and Long (1937), Crawford and Fleming (1938), Somers (1939), and Bryant and Fairman (1939). Of particular interest, however, are the papers by Banks (1938, 1939), both because of the relatively large number of cases treated and because of the carefully controlled manner in which his investigations were carried out. In one series of 65 cases serum ("meningococcus antitoxin" P. D. and Co.) was given intravenously in large amounts and sulphanilamide in various dosages, and there were 8 deaths. A comparable series of 72 cases was treated by chemotherapy alone in large dosage, and there was 1 death. This remarkable result may be regarded partly as a personal triumph for Dr. Banks and his nursing staff, because the results obtained elsewhere are far less remarkable. Banks (1940), for example, gives some figures, supplied by Dr. E. L. Sturdee, of the results obtained by chemotherapy alone in hospitals throughout England and Wales in 1937–39. There were 100 patients, and 29 died. Harries (1940) has described another 100 cases treated with sulphapyridine only, with 8 deaths.

The following figures may serve as a basis for comparison with these. Before the introduction of serum therapy the case-mortality of cerebrospinal fever was 60–80 per cent. Treatment with adequate amounts of serum at the earliest possible moment will reduce this figure to a third or even less, provided that the serum contains specific antibodies for the prevailing type of meningococcus. Wadsworth (1932), for example, obtained a case-mortality of 18·4 per cent. among 742 patients of all ages; and Banks (1938) has reported a series of 38 cases with 6 deaths.

The question at issue is whether antimeningococcus serum can still be usefully employed as an adjuvant to chemotherapy, or whether, as Banks insists, it should be entirely dispensed with. The Ministry of Health (1940) appears to favour the latter view. Laboratory studies, which can be conducted under controlled conditions impossible in clinical practice, do not support this contention. The practical importance of this problem at the present time justifies the publication of the following experiments which, it is hoped, may induce clinicians to give a further trial to combined treatment with sulphapyridine and antimeningococcus serum.

TECHNIQUE

Mice were inoculated with a highly virulent strain of meningococcus suspended in mucin. One group received the test dose of organisms alone, while other groups received also serum, or sulphapyridine, or a combination of these. The interval between the inoculation of the meningococci and the institution of treatment was varied in different experiments, while the dosage of the drug or of the serum was kept constant.

Two group-I meningococcus strains, here designated 198 and 220, were chosen for this work because of their exceptional virulence to mice. Both of them were originally obtained from Dr. W. M. Scott, of the Ministry of Health, No. 198 in May, 1939, and No. 220 in February, 1940. Each had been recently isolated from a case of cerebrospinal fever. They were maintained on nutrient agar containing 2 per cent. of bacteriological peptone (Evans Sons Lescher and Webb), 0·5 per cent. of glucose, and 5 per cent. of defibrinated horse blood. Subcultures were made at intervals of twelve hours, and the strains were passed through mice at least once a week.

A five-hour culture was used for infecting the mice. After the water of condensation had been removed and discarded, the growth was thoroughly dispersed in plain nutrient broth and then further diluted with the same medium until the suspension matched the opacity of a standard suspension of barium sulphate. The number of organisms required to produce this degree of opacity was approximately 600 million. No great importance is attached to the estimate of the number of cocci injected, because the usual methods of enumerating bacteria are associated with a large experimental error. In each experiment the activity of the suspensions was tested by determining the minimal lethal dose (M.L.D.) by titration on groups of 5 mice, and in this way it was possible to express the test dose in terms of the number of M.L.D. injected. All dilutions were made in plain broth, except the final dilution, which was prepared in a 5 per cent. solution of mucin. This mucin was obtained from the Wilson Laboratories, Chicago, under the designation Granular Mucin Type 1701 and was prepared according to the method of Miller and Castles (1936).

The infecting dose was injected intraperitoneally in a volume of 1·0 c.cm. The dose of sulphapyridine was 20 mg. suspended in 0·5 c.cm. of physiological saline. This was injected into the lumen of the œsophagus with a wide-bore needle, of which the point had been removed and the end ground to a smooth bevel. The serum used in each experiment was taken from a batch of multivalent antimeningococcus globulin prepared for normal issue. A volume of 0·004 c.cm. of this solution of globulin protected mice against 1000 minimal infective doses of group-I meningococci. The serum was injected intravenously. The mice weighed 17–21 g. A pure-line strain not being available, it was necessary to use about 20 mice in each test group. The time between infection and treatment varied in different experiments between four and thirteen hours. With the two strains of meningococci employed invasion of the blood-stream could be demonstrated two hours after the injection of the test dose of organisms.

RESULTS

The results of thirteen therapeutic and two prophylactic experiments are summarised in table I. The inclusion of several variable factors renders these numerical data unsuitable for statistical analysis, but it is admissible to give the totals obtained by adding the figures of each experiment, provided that it is clearly recognised that these totals (table II) must be regarded as an indication of the trend of the results and not as an accurate analysis.

In every experiment the number of deaths was least in the group of mice that received both sulphapyridine and serum. In some cases the superiority of the combined treatment is admittedly not great, and the differences are not statistically significant. In

TABLE I

RESULTS OF TREATMENT OF EXPERIMENTAL MENINGOCOCCAL INFECTION OF MICE

Expt.	Strain	M.L.D. injected	No. of cocci in 1 M.L.D.	Interval between test dose and treatment	Controls (no treatment)			Treatment								
								Serum only			Sulphapyridine only			Serum and sulphapyridine		
					No. of mice	Died	Survived	No. of mice	Died	Survived	No. of mice	Died	Survived	No. of mice	Died	Survived
1	198	1000	2000	6 hours	10	10	0	10	10	0	10	7	3	10	6	4
2	,,	10,000	200	6 ,,	10	10	0	20	18	2	20	18	2	20	3	17
3	,,	100	20,000	6 ,,	20	16	4	40	10	30	20	3	17	20	1	19
12	,,	1000	2000	5 ,,	20	20	0	20	16	4	20	13	7	20	8	12
13	,,	1000	2000	5 ,,	20	20	0	20	15	5	20	10	10	20	0	20
4	220	10,000	200	6 ,,	20	18	2	20	10	10	20	1	19	20	0	20
5	,,	10,000	200	6 ,,	20	19	1	20	20	0	20	19	1	20	17	3
6	,,	10,000	200	5 ,,	20	19	1	20	18	2	20	20	0	20	10	10
7	,,	100,000	20	4 ,,	20	17	3	20	8	12	20	13	7	20	1	19
8	,,	10,000	200	4 ,,	20	20	0	—	—	—	50	16	34	50	10	40
9	,,	1000	2000	5 ,,	20	19	1	20	18	2	20	10	10	10	0	10
10	,,	100,000	20	5 ,,	20	19	1	20	19	1	20	20	0	20	8	12
11	,,	100,000	20	5 ,,	20	20	0	20	20	0	20	15	5	20	6	14
P	198	100	20,000	0 ,,	10	10	0	10	0	10	20	0	20	10	0	10
P	220	100,000	20	0 ,,	20	20	0	10	0	10	20	2	18	20	0	20

P = prophylaxis. In the two prophylactic experiments the amount of serum injected was 0·01 c.cm.

experiments 2, 6, 9, 10, and 11, however, the results indicate that the drug and serum exerted a synergic action, the combined effect being considerably greater than that produced by either alone.

The case-mortality should not be taken as the sole criterion of success. Further information can be obtained by a comparison of the average duration of illness in the mice (see table III).

COMMENTS

The results, taken as a whole, clearly demonstrate the value of giving serum besides sulphapyridine to cure experimental meningococcal septicæmia in mice. Such a procedure is, moreover, entirely rational. Without treatment the host's natural defences, inhibited by the mucin, cannot prevent rapid multiplication of the invading organism. Sulphapyridine prevents this multiplication and so gives the host time to reorganise its immunological mechanism. If the administration of the drug is unduly delayed, the overwhelming number of organisms already present precludes the possibility of recovery, because the toxins liberated by autolysis of the meningococci will exert a lethal effect after the cocci have ceased to proliferate. On the other hand, when the combined treatment is given, sulphapyridine holds the organisms in check while the specific antibodies injected, together with such natural defences as the host may succeed in mobilising, are rendered immediately available for killing the invading organism and neutralising its toxins. These fundamental principles are valid whether the host is a man or a mouse. Clinical

TABLE II—ANALYSIS OF RESULTS SHOWN IN TABLE I

Treatment	Infecting strain, 198		Infecting strain, 220	
	No. of mice	Survivors	No. of mice	Survivors
None (controls) ..	80	4	160	9
Serum only	110	41	140	27
Sulphapyridine only ..	90	39	190	76
Sulphapyridine and serum	90	72	180	128

experience, however, does not favour the addition of serum to sulphonamides; yet the results of the experiments here recorded seem to call for further trial of a method so essentially rational.

SUMMARY

A meningococcal septicæmia, normally fatal, was produced in mice by intraperitoneal injection of a highly virulent group-I strain of meningococcus suspended in mucin. At various periods after infection the mice received sulphapyridine, or anti-meningococcus serum, or a combination of these. The combination of drug and serum gave better protection than that obtained with the drug alone. The average case-mortality in mice treated with sulphapyridine only was 59 per cent., whereas the giving of serum besides the drug reduced it to 26 per cent. It is suggested that the use of antimeningococcus serum, given intravenously, as an adjuvant to chemotherapy in human cerebrospinal fever deserves further clinical trial.

TABLE III—VALUE OF COMBINED TREATMENT IN CUTTING SHORT THE ILLNESS

(Figures taken from protocol of expt. 13)

Treatment	Average duration of illness (hours)	
	In mice that died	In mice that survived
None (controls)	22	—
Serum only	45	52
Sulphapyridine only	45	61
Sulphapyridine and serum ..	—	21

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ATROPINE AND ERGOTOXIN AS ANTIDOTES TO SCORPION TOXIN

BY ALI HASSAN, M.D., AND AHMED HASSAN MOHAMMED, M.Sc. Cairo

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ONE of us (A. H. M.)[1] has demonstrated that scorpion toxin[2] is a powerful stimulant of the autonomic nervous system. Solutions of the toxin, freed completely from other telson proteins, produce a rise of blood-pressure in the anæsthetised dog which is abolished or even reversed by the administration of ergotoxin. In the rabbit scorpion toxin produces a hyperglycæmia lasting three or four hours. In the isolated toad's heart it causes acceleration and augmentation of the beat, and it produces immediate relaxation of the virgin guineapig's uterus.

As a stimulant of the parasympathetic system it excites salivary secretion and lacrimation, which are two characteristic manifestations of poisoning by scorpion toxin in the rat and in the dog. It also causes diarrhœa in many animals—e.g., the rabbit and the dog.

INVESTIGATION

These observations led us to study the action of paralysants of the sympathetic and parasympathetic nerves, such as ergotoxin and atropine, on animals poisoned with scorpion toxin.

We found that in the rat a subcutaneous injection of ergotoxin, though it does not abolish the salivation and lacrimation completely, may save the rat from otherwise certain death. Atropine had a similar effect, as shown in table I.

TABLE I—SURVIVAL AFTER ATROPINE OR ERGOTOXIN OF RATS INJECTED WITH A MINIMUM LETHAL DOSE OF SCORPION TOXIN

Ergotoxin (mg.)	Result	Atropine (mg.)	Result
0·06	Died	0·4	Died
0·18	,,	0·8	,,
0·24	,,	1·2	,,
0·30	Survived	1·6	Survived
1·20	,,	2·0	,,
2·40	,,	2·4	,,

The combined influence of both drugs was then investigated, and it was found that the best protective combination was one made of atropine 1·6 mg. and ergotoxin 0·24 mg. This mixture injected simultaneously with the toxin saved rats injected with as much as three times the minimum lethal dose (m.l.d.).

Believing that the above result might be applicable to man, we decided to determine how long after receiving a lethal dose a rat might be saved. Therefore rats weighing 200 g. each were divided into groups of three, and each rat received a subcutaneous injection of 0·14 mg. of a toxin whose m.l.d. was 0·12 mg. At various intervals after the injection of toxin each rat received ergotoxin 0·24 mg. and atropine 1·6 mg. as an antidote. Table II embodies the results obtained.

1. Unpublished thesis for the M.Sc. degree, Egyptian University, Cairo.
2. Toxin prepared from a mixture of the telsons of the three most common Egyptian scorpions but with a marked preponderance of those of *Buthus quinquestriatus*.

The protective influence of these drugs was next studied in dogs, which are much more sensitive than rats to scorpion toxin. Earlier investigators have already shown that the sensitivity of different species of animals towards scorpion and similar toxins varies. The m.l.d. of a pure specimen of scorpion toxin prepared in this laboratory was found to be 0·042 mg., 0·20 mg., and 0·03 mg. per kg. of body-weight for the guineapig, the rat, and the dog respectively. The ergotoxin-atropine combination was found to be equally effective when given to dogs. Here, however, it was possible to lower the dose of ergotoxin to 0·005 mg. and that of atropine to 0·1 mg. per kg. of body-weight. Thus, for a dog weighing 6 kg. ergotoxin 0·03 and atropine 0·60 will be required to protect it against one m.l.d. or 0·18 mg. of pure toxin. These quantities will be ineffective when given to a rat weighing 100 g. injected with 0·02 mg. of toxin only. One may therefore conclude that in different species the protective amount of ergotoxin and atropine is not determined so much by the amount of toxin injected as by the sensitivity of the animals to these drugs.

TABLE II—INFLUENCE OF TIME ON THE PROTECTIVE ACTION OF ATROPINE AND ERGOTOXIN

Group	Time elapsed between injection of toxin and injection of antidote	Rats injected	Rats survived
1	20 minutes	3	3
2	75 ,,	3	2
3	90 ,,	3	2

One injection of the two drugs given simultaneously within two hours after 1 m.l.d. of toxin can save the dog. Dogs injected with 2 m.l.d. die unless given two doses of the drugs with an interval of an hour between each dose. The following is an actual example of such a case:—

A dog weighing 5·5 kg. was injected subcutaneously with 2 m.l.d. of scorpion toxin at 3 P.M. There was local pain, salivation, lacrimation, diarrhœa, and vomiting. At 4 P.M. the dog was given a dose of atropine and ergotoxin. The symptoms cleared up completely but returned in a milder form towards the end of the second hour. When the injection of atropine and ergotoxin was repeated at 5 P.M., the symptoms disappeared for good this time, and the dog was saved.

It was not possible to save dogs injected with more than 2 m.l.d., and, unlike rats, dogs could not be saved by atropine alone or ergotoxin alone.

DISCUSSION AND CONCLUSIONS

The antagonistic action of atropine and ergotoxin not only proves that scorpion toxin stimulates the autonomic nervous system but also suggests the possibility of employing these drugs alone or in conjunction with the specific antiserum as curative agents against poisoning by this toxin. The result obtained in dogs is encouraging, for it shows that a dog injected with as much as 0·36 mg. of pure toxin can be saved by injections of these drugs. This amount of toxin (0·36 mg.) is definitely large; but, if it can be shown that a scorpion seldom injects so much in one sting, one may be justified in entertaining some hopes about the application of this procedure in man.

The dry telsons of Egyptian scorpions yield on an average 0·55 mg. of toxin per telson. A fully grown specimen of *B. quinquestriatus*, excited to strike seven times a stretched rubber membrane, gave a few

droplets of venom whose content of toxin was 0·5 mg. Another scorpion of the same species and size, excited to strike thrice, gave only about 0·2 mg. of toxin. By electrical stimulation of the junction of the terminal segment with the telson of a living *B. quinquestriatus* 0·6 mg. of pure toxin was obtained.

The amount of toxin was determined by a simple means. Since the m.l.d. for a rat weighing 100 g. is 0·02 mg. of toxin, the toxin content of any solution can be easily obtained by finding the smallest lethal dose and calculating the total amount accordingly. It thus appears that the greatest amount of toxin which this species can inject is not large, and its action may be successfully antagonised in man by an appropriate amount of ergotoxin and atropine.

SUMMARY

(1) Atropine alone or ergotoxin alone may save rats injected with a lethal amount of scorpion toxin.

(2) A combination of the two drugs is more effective than one alone. This is also true in the case of dogs, which can be saved after receiving even 2 m.l.d.

(3) The employment of this procedure in the treatment of scorpion sting in man is suggested.

AUTOGRAFT OF AMPUTATED DIGIT

A SUGGESTED OPERATION

By Sir Harold Gillies, F.R.C.S.

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Attempts have been made in the past to graft severed fingers or to replace them by transplantation of a similar digit from elsewhere, but the results have only occasionally been successful. This failure appears to be due to the impossibility of providing an adequate blood-supply for the skin and deeper tissues through the line of division. The essential parts of the fingers are the bones and tendons; these tissues require but little blood-supply and can be transplanted with a reasonable certainty of success. The skin and subcutaneous tissues are less essential but are much more avid of an immediate blood-supply. Fortunately, however, both the skin and the subcutaneous tissues can be replaced as a secondary procedure with every chance of success. It is therefore suggested that the following method or some modification of it holds out great hope of being able to restore a functional digit after clean amputation of a finger.

TECHNIQUE

The skin of the stump is cleansed and trimmed, and the ends of the tendons are picked up. The undamaged skin on the dorsum of the stump should be removed ½ in. or more proximal to the amputation line, so that the line of junction of skin and skeletal tissues is at different levels. The severed finger is thoroughly cleaned in soap and water and immersed in spirit for a short period. The skin, subcutaneous tissues, and nail are dissected away (fig. 1). The

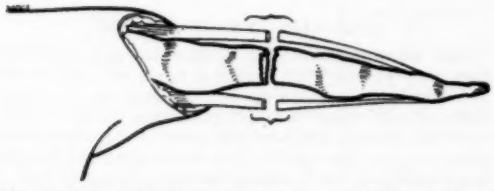

Fig. 1—Skin and nail dissected from amputated digit and damaged tissues trimmed. Skin removed proximal to traumatic section.

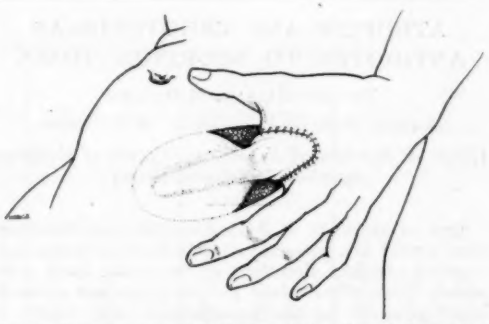

Fig. 2—Insertion into abdominal pocket. Curved free end of pocket sutured to hand.

tendons are united in the usual fashion, and the cut ends of the bone are held in correct position by a few silk or catgut sutures. In other words, the severed finger minus its cutaneous covering has been replaced on the hand. Next a subcutaneous pocket is created in the abdominal wall to receive the denuded finger. This pocket should be in such a position that the hand will lie comfortably and will be capable of accurate fixation in that position. The pocket should be as near the skin as possible, so that the skin, with little intervening subcutaneous tissue, will become adherent to the skeletal structures of the finger. The mouth of the pocket should be accurately sutured to the skin of the hand in its complete circumference, and if it is curved it will fit better and give a larger catchment area to the grafted skin (fig. 2). The severed bone and tendon should thus acquire a blood-supply partly from the skin covering and partly from the subcutaneous tissues of the abdominal wall. After a minimal period of three weeks a flap of skin sufficiently large to restore the whole covering of the finger is outlined on the abdominal wall and is partly raised from its bed on each side of the finger and replaced (fig. 3). The final division may be made a week later and the two halves sutured round the digit (fig. 4). There will at first be no sensation in the finger, but this should begin to return at the end of six to twelve weeks. It is possible that complete restoration of tactile sensibility might never be completely re-established, but it is certain that sufficient sensation would be acquired to render the regrafted digit useful.

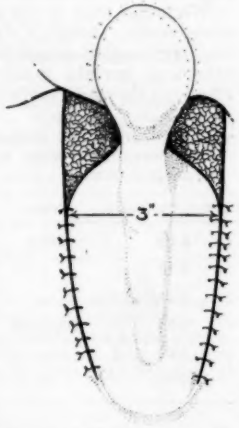

Fig. 3—After three weeks. Delay operation—i.e., flap incised on each side, undermined, and replaced.

ALTERNATIVE PROCEDURE

An alternative procedure might be employed when there are reasons against undertaking a complete repair. In these circumstances the denuded finger might be inserted into the abdominal wall without prior attachment to the hand. The amputated digit should be thoroughly scrubbed and cleansed with soap and water and washed in spirit, and its skin and nail carefully dissected off. The abdominal skin likewise is thoroughly cleansed, a small incision made under local anæsthesia, and the skin undermined for about 1 in. longer than the digit to be implanted. The amputated digit, completely denuded of skin and

subcutaneous tissue and nail-bed, should then be inserted into the pocket to lie close under the skin with its dorsal surface forwards and its base well inside the incision, which is then closed with a few stitches. The stump would be best closed as far as possible, probably after fixation of the tendons, with a few silk sutures to avoid retraction. The union of the digital elements could be undertaken at a later date. The case can then be sent for plastic treatment on the lines indicated above.

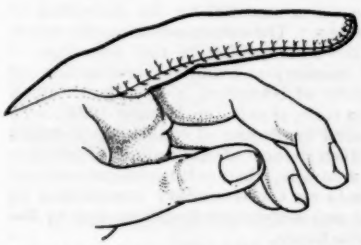

FIG. 4—After four weeks. Completion of plastic operation.

The details of the operation were worked out some years ago, but owing to lack of material there has not been any opportunity of performing it. The idea of denuding the amputated portion completely of its skin is believed to be new; and, if it proves satisfactory, it opens up the possibility of grafting a digit from a recently dead patient or from a recently amputated arm. It is known that skin cannot be transplanted from one patient to another, but cartilage, bone, and possibly tendon are more amenable. This note is published in the hope that others, possibly factory surgeons, may have the opportunity of trying the operation.

THE CONCUSSIONAL AND POST-CONCUSSIONAL SYNDROMES *

BY C. T. VAN VALKENBURG, M.D. Amsterdam

THE diagnosis of concussion is usually based on the association of unconsciousness and an injury to the head (Symonds 1935), but this combination may also be found in epilepsy, minor apoplexy and even simple syncope. The second cardinal symptom of concussion, retrograde amnesia, may also be due to these other conditions, though less often. The remaining symptoms, such as headache, vomiting and dizziness, though important, are neither constant nor pathognomonic. A more objective sign of concussion is therefore wanted, and I believe I have found it in lymphopenia (van Valkenburg 1931). In most cases this is present only during the first day after the injury; in others it may be found till the third or fourth day, but seldom longer. At the same time the eosinophils disappear and there is a polymorphonuclear leucocytosis (10,000–30,000); the leucocytosis decreases as the eosinophils reappear and the lymphocytes increase again. Since leucocytosis and absence of eosinophils are by no means uncommon in other conditions, I have laid special emphasis on the lymphopenia. My experience in the last few years has confirmed that it is pathognomonic. In 241 cases of concussion I have found a low lymphocyte-count in 91 per cent., unconsciousness in nearly 98 per cent.,† and retrograde amnesia in 94 per cent. Unconsciousness, retrograde amnesia and lymphopenia after an injury to the head therefore constitute the triad of concussion. When these three things are absent I do not consider the condition to be concussion, even if headache and dizziness are present.

A lymphocyte-count of less than 1500 is regarded as an absolute lymphopenia; where the lymphocyte-count is over 1500 but the lymphocytes make up less than 10 per cent. of the total leucocytes I regard this as a relative lymphopenia. In children, whose lymphocyte-count is normally high, the proportion of lymphocytes falls as a rule to 10–20 per cent., though this is not invariable (see case 1). In children, therefore, it is important to watch for a rise in lymphocytes after the first day or so (see case 5).

ILLUSTRATIVE WHITE-CELL COUNTS (CASES 1–5)

CASE 1.—A girl, aged 4, with unconsciousness, lymphopenia, vomiting, fractured skull, and transient aphasia.

Time	Leucocytes	Basophils (per cent.)	Eosinophils (per cent.)	Polymorphs (per cent.)	Lymphocytes (per cent.)	Monocytes (per cent.)
1st day	23,000	0	0	91·0	5·5	3·5
2nd ,,	20,400	0	0	85·0	8·0	7·0
3rd ,,	22,500	0	0	82·5	12·0	5·5
4th ,,	18,600	0	0	86·5	6·5	7·0
5th ,,	18,000	0	1·5	—	13·5	5·0
8th ,,	10,000	0	4·5	57·5	28·5	10·5

CASE 2.—A man, aged 26, with unconsciousness, retrograde amnesia, lymphopenia, vomiting, headache, and restlessness.

1st day	16,500	0	0	88	4	8·0
2nd ,,	10,900	0·5	0	86	11	10·5
3rd ,,	8,300	0	0	62	27	11·0

CASE 3.—A man, aged 81, with unconsciousness, doubtful retrograde amnesia, posterograde amnesia, lymphopenia, vomiting, and headache.

1st day	15,300	0	0	87·0	5·0	8·0
2nd ,,	15,200	0	0	79·5	11·5	9·0
3rd ,,	13,500	0	0	87·0	8·0	5·0
4th ,,	11,500	0·5	0	83·0	7·5	8·5
5th ,,	8,200	0	0	69·0	18·5	12·5

CASE 4.—A woman, aged 47, with no unconsciousness and no retrograde amnesia.

1st day	10,400	0·5	0	84	10·5	5·0
2nd ,,	6,000	0·5	0	89	9·0	6·5
3rd ,,	6,700	0	1·5	71	18·0	9·5

CASE 5.—A girl, aged 3, with unconsciousness, vomiting, restlessness. There was no lymphopenia, and the lymphocyte-count suddenly increased on the fourth day.

1st day	11,400	0	0	77·0	19·5	3·5
2nd ,,	10,500	1	0	74·0	21·0	4·0
3rd ,,	5,900	0	4	42·0	45·5	8·0
4th ,,	8,500	1·5	8	43·5	42·0	7·0

* Based on a lecture delivered before the Zuidholland Neurological Society, June 2, 1939.

† Gamper (1938), whose views on the localisation of concussion correspond with mine, accepts the possibility of unconsciousness being absent on theoretical grounds.

PHYSIOLOGY OF CONCUSSION

Concussion is caused by a shock to the head (almost always a direct blow) which is propagated most probably through the ventricular fluid and affects mainly the region about the third ventricle. The damage to the autonomic nervous structures of that region (hypothalamus) is the necessary condition for the appearance of the triad. This damage is reversible, except sometimes when there is hæmorrhage. (Strictly speaking, the possibility of death after uncomplicated concussion cannot absolutely be denied; but no such case has come to my knowledge.) All other lesions of the brain are distinct from concussion, although they may complicate it. I have seen all sorts of severe neurological troubles, such as hemiparesis and aphasia, after injury to the head, especially after depressed fractures, where concussion was definitely absent. The difference between concussion and contusion of the brain is absolute; the current opinion, that it is a matter of degree, appears to be erroneous.

Changes in the blood, both chemical and cellular, after lesions of the hypothalamic region are well known from experimental and pathological findings (Ginzberg and Heilmeyer 1932); but a more or less constant lymphopenia in such cases has not been reported, as far as I know. I have not made in all cases a complete routine chemical examination of the blood. Albumin and glucose were occasionally found in the urine. Other symptoms, such as changes in the rate and character of the pulse, headache, vomiting, and dizziness, may support the diagnosis of concussion but are in themselves not of importance in diagnosis, because each of them may be found in different conditions, with or without injury to the head. The same may be said of a lowered blood-pressure, which is often found; moreover, the examiner's ignorance of the patient's blood-pressure before the accident makes the observation less conclusive. Granting the importance of all these signs, particularly when a diagnosis has to be made a posteriori, I have made it a rule, immediately after any injury to the head, to look for the above-mentioned triad.

POSTCONCUSSIONAL STATE

After a patient with concussion has regained consciousness, lymphopenia is the first sign to disappear; vomiting ceases generally after one or two days. The other symptoms decrease more or less slowly under adequate treatment. The postconcussional state is generally dealt with under the heading of craniocerebral injury (traumatic encephalopathy). It is a part of the clinical picture of concussion but should be considered as a separate entity, in which the symptoms due to primary impairment of vegetative neurological functions do not arise. It is somewhat arbitrary to fix the period after the primary accident when the postconcussional state begins. Most patients gradually return to ordinary life after four to six weeks' rest and resume their occupations about three months after the accident. I consider those who are not able to do so to be in the postconcussional state. Their typical symptoms, most of which are objectively demonstrable, are the following:—

(1) Impairment of memory.
(2) Fatigability, mental and bodily.
(3) Hypersensibility.
(4) Vasomotor and emotional instability.
(5) Headache, particularly after exertion.
(6) Giddiness, of various degrees.

The intimate connexion of symptoms (4), (5), and (6) with autonomic functions needs no further explanation. Hypersensibility, particularly visual and acoustic, does not depend on a primary derangement of function of sense organs or their cerebral representation; it is at once understandable if we remember that the activity and the reactivity of the animal nervous system finally depends on the coöperation of the autonomic system (Hess 1936). Fatigability is similarly explained. Memory is closely bound to the activity of the nervous structures about the third ventricle, whose aid is essential for the activation of cortical mechanisms. The retrograde amnesia which immediately follows concussion is the first sign of disturbance of memory; complete restoration of memory, especially of retention, is usually obtained only after a long time, if ever (de Morsier 1936). To sum up, the initial syndrome of concussion depends directly on a disturbance of autonomic structures about the third ventricle, whereas the postconcussional syndrome depends on the secondary impairment of general cerebral and vegetative functions due to the diencephalic disturbance.

It is usual to lay stress on the "nervous" character of the postconcussional syndrome, particularly where claims for compensation seem to play an important part. In Holland "compensation neurosis" is not seen to any great extent. Whether a man suffering from the sequels of concussion has or has not a claim to compensation, his symptoms are essentially the same. There may, however, be circumstances that make the patient nervous; in most cases they are caused by the attitude of those round him, including his doctor, and by the suspicion shown towards him by the medical officers of the insurance company, which raises a comprehensible opposition in the patient, who in turn is inclined to aggravate his symptoms. An injury to any other part of the body would produce the same state of affairs.

Elderly people, nervous people, and patients with severe concussion are more liable to a severe postconcussional syndrome. After the age of 50 or 60 the human brain is as a rule less able to recover from traumatic and other lesions, even when it seemed to be in good condition before. The vegetative system of nervous people, particularly those of the constitutionally anxious type, is characterised by its instability. Its reaction to injuries of all kinds is therefore stronger and lasts longer than in better balanced people. In severe concussion we have to do with a severe trauma that disturbs the activity of diencephalic autonomic centres to an extreme degree. Even if the patient's nervous system had been in perfect order before, it is understandable that for a long time after concussion the autonomic nervous system is impaired, and the brain regains but slowly its regular activity.

The condition described bears a striking resemblance to so-called neurosis. Indeed this term is applied to postconcussional states; practically it postulates a mental cause (Ryle 1939). If the neuroses affecting the heart, stomach, intestine and other organs were not so much associated with the presumption of a merely psychic causation, the definition would suit the late postconcussional condition well. It might be defined as a functional disorder, following concussion, affecting the autonomic system, in which inborn or traumatically acquired "nervous" qualities take a part—a brain neurosis.

The possibility of purely emotional (hysterical) symptoms after uncomplicated concussion must be admitted; they are much rarer than is generally accepted, and they do not differ from those after traumatic lesions elsewhere.

SUMMARY

The syndrome of concussion is chiefly characterised by unconsciousness, retrograde amnesia, and lymphopenia. The lesion is localised about the third ventricle (hypothalamus). The postconcussional syndrome depends on the impairment of autonomic functions and their relation to cerebral activity; it is directly related to the primary injury to the brain.

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RADIOLOGICAL DEMONSTRATION OF ADENOIDS

BY G. T. CALTHROP, M.D., D.M.R.E. Camb.

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THE diagnosis of "adenoids" can usually be made with little difficulty, but there are cases, especially in children, in which it is impossible to obtain a view of the nasopharynx either by anterior or by posterior rhinoscopy. The only other method of direct diagnosis is that of inserting a finger into the posterior nasopharynx—a procedure which, in my view, should never be carried out in the unanæsthetised child.

In cases in which symptoms remain in spite of tonsillectomy, or arise after this operation, the question is sometimes raised whether adenoids have been removed or whether they have grown again. In children sent to me for radiological examination because of coughs, low-grade fever or debility I have sometimes found that the chest and antra showed no abnormality, but that in the radiogram of the nasopharynx there was an opacity due to soft tissue in the situation of the adenoids. Examination under an anæsthetic confirmed this, and on each occasion a mass of adenoids was surgically removed and the symptoms were relieved.

The method is simple, but it appears to have been neglected both in practice and in the literature. Groth,[1] of Upsala, described the radiological appearances and mentioned that, except for a statement by Mignon in 1898 and by Scheier (quoted by Bonchard in 1904) that adenoids could be seen on the fluorescent screen, he had found no reference to them in radiological or otolaryngological literature.

1. Groth, K. E., *Acta radiol., Stockh.* 1933, **14**, 463.

The technique is to take a true lateral view of the skull with the chin raised; the central ray must pass 1 in. in front of and 1 in. below the external auditory meatus. It is preferable to use a soft ray, so as to show up the details of the soft tissue.

It is not claimed that it is possible to show small remnants left behind by incomplete operation, but a large or moderate mass of adenoid tissue should be easily visible in the nasopharynx (see figure).

My thanks are due to Mr. Charles Keogh, F.R.C.S., for his help and advice.

PURPURA HÆMORRHAGICA AFTER ARSENIC THERAPY TREATED WITH VITAMIN P

BY D. ROBERTSON GORRIE, M.B. Glasg., D.P.H.

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BLOOD dyscrasia after arsphenamine therapy is comparatively rare, yet in 1932 McCarthy and Wilson found seventy-nine cases recorded and added two of their own. I have found a further twenty-one cases recorded since that date. Vitamin P has given good results in Schönlein-Henoch purpura (Jersild 1938) but only two cases of purpura hæmorrhagica developing after arsenic therapy and treated with this substance have been reported in this country (Scarborough and Stewart 1938).

CASE-RECORD

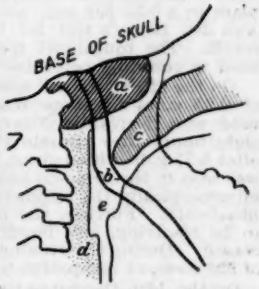
A man, aged 30, unemployed and unmarried, had gonorrhœa in 1935 and again in 1936. He had primary syphilis in 1937, for which he was given a course of twelve injections of Neo-kharsivan, totalling 7·05 g., and twelve injections of bismuth metal, amounting to 2·4 g. This was followed by six injections of a second course of treatment, during which 3·45 g. of neoarsphenamine and 1·2 g. of bismuth metal were given. There was no history of any tendency to hæmorrhage. The blood Wassermann reaction was positive at the beginning of the first course of treatment and negative at the end of the second (unfinished) course.

On Oct. 19, 1939, he developed a preputial chancre, from which *Treponema pallidum* was obtained. In view of the positive Wassermann reaction of the blood-serum, this could only be considered as a probable reinfection. Between Oct. 25 and Nov. 27 he received seven injections of neoarsphenamine, amounting to 4·05 g., and seven injections of bismuth metal, totalling 1·4 g. Eighteen hours after his last injection of neoarsphenamine, he complained of a rash on the legs and bleeding from the mouth and bladder.

LATERAL RADIOGRAMS OF NASOPHARYNGEAL AREA

(1) (2)

(1) before and (2) after removal of adenoids.



Key—(*a*) adenoid tissue; (*b*) ascending rami of mandible; (*c*) soft palate; (*d*) soft tissues of posterior pharyngeal wall; (*e*) lower part of nasopharyngeal space.

BLOOD EXAMINATIONS

Date	Red cells (per c.mm.)	Hb. (per cent.)	Colour-Index	White cells (per c.mm.)	Polymorphs (per cent.)	Lymphocytes (per cent.)	Monocytes (per cent.)	Reticulocytes (per cent.)	Platelets (per c.mm.)	Bleeding time (min.)	Coagulation time (min.)	Petechiæ
1939												
Dec. 7	2,620,000	50	0·9	4400	60	26	13	Nil	Nil	11+	15+	44
,, 12	2,705,000	58	1·07	5700	—	—	—	—		—	—	—
,, 13	2,540,000	55	1·1	5200	76	12	11	—	Much reduced in blood film	—	—	—
,, 14	2,590,000	59	1·1	—	—	—	—	4·4	—	—	—	—
,, 15	3,090,000	60	0·9	4600	—	—	—	—	—	—	—	—
,, 17	3,130,000	61	0·9	4800	—	—	—	—	—	2	15	3
,, 19	3,080,000	62	1·01	4000	—	—	—	—	—	—	—	—
,, 20	3,130,000	64	1·03	5300	—	—	—	—	—	—	—	—
,, 22	3,235,000	66	1·03	—	63	29	8	5·4	Abundant in blood film 339,499	—	—	—
,, 26	3,310,000	75	1·10	5200	—	—	—	—	—	—	—	—
1940												
Jan. 3	3,990,000	85	1·07	5600	—	—	—	—	—	—	—	—

On his admission to Belvidere Hospital on Nov. 31 examination revealed a well-nourished man of good physique. The temperature, pulse, and respirations were normal. Over the lower two-thirds of both legs was a profuse eruption of fresh petechiæ 2–10 mm. in diameter. Scanty petechiæ were present also on the forehead, trunk, and upper limbs. There were ecchymoses at the sites of injections in the antecubital fossæ and buttocks. The gums were bleeding and a few petechiæ were seen on the tongue. The urine was loaded with blood but otherwise normal. The nervous system, heart, and lungs showed no abnormality. A radiogram of the chest was normal.

The patient was treated with intravenous injections of sodium thiosulphate and intramuscular injections of calcium gluconate, without any clinical improvement. On Dec. 3 his temperature rose to 100° F., and he complained of a sore-throat. The left tonsil was swollen and covered with greyish adherent exudate, which seemed to be invading the adjacent buccal mucosa. The breath was fœtid. Since the appearance suggested faucial diphtheria, 40,000 units of antitoxin was given intramuscularly; but subsequent culture was negative for *Corynebacterium diphtheriæ*, and a direct smear showed Vincent's spirochætes and fusiform bacilli. On Dec. 5 and 6 pyrexia continued, and the necrotic process spread to the uvula, which was now displaced to the right by swelling of the left tonsil.

The blood was examined on Dec. 7 (see accompanying table). The clotting-time was measured by the method of Lee and White with a test-tube 14 mm. in diameter. The bleeding-time was determined by Duke's method. Hæmolysis of the red cells took place in a 0·35 per cent. solution of sodium chloride. Van den Bergh's test for bilirubin gave a negative result. The tourniquet test of Göthlin (1933) was used in counting petechiæ.

On the 9th vitamin P was given by mouth in doses of 0·25 g. at two-hour intervals. The preparation used was Hesperidin (Glaxo). On the 11th, forty-eight hours after vitamin P therapy was begun and after 5·75 g. had been given, for the first time no blood was seen in the urine on naked-eye examination, and microscopically the sediment showed only a few red blood-cells. Further, the necrotic angina appeared to be resolving, and bleeding from the mouth had ceased. During the evening of this day a transfusion of 525 c.cm. of compatible group-IV blood was given.

On the 14th the patient complained of dimness of vision in the left eye. Ophthalmoscopy revealed three small recent intraretinal hæmorrhages, one lying just above the optic disk, between the superior temporal and the superior nasal arteries, and the other two in the region of the macula. The right fundus was normal. An estimation of the amount of ascorbic acid in the blood on the 9th and a skin test for ascorbic acid on the 14th (Dr. W. McAdam) indicated saturation. The subsequent progress of the case is summarised in the accompanying table.

The sternal marrow was examined on the 10th. The following is Dr. McAdam's report: segmented neutrophils 12 per cent.; segmented eosinophils 0; segmented basophils 0; neutrophil metamyelocytes 8 per cent.; eosinophil metamyelocytes 0; basophil metamyelocytes 0; neutrophil myelocytes 9 per cent.; eosinophil myelocytes 1 per cent.; basophil myelocytes 2 per cent.; premyelocytes 3 per cent.; myeloblasts 2 per cent.; lymphocytes 11 per cent.; monocytes 7 per cent.; normoblasts 30 per cent.; erythroblasts 8 per cent.; and megaloblasts 0.

It will be seen that the number of white blood-cells remained low throughout. The red cells and hæmoglobin increased steadily with treatment. Ferrous iron was given from Dec. 13, 1939, to Jan. 3, 1940, gr. 6 thrice daily; and from Dec. 19, 1939, to Jan. 3, 1940, vitamin C 100 mg. was given daily. The preparations used were Fersolate (Glaxo) and Redoxon (Roche).

COMMENTS

Purpura hæmorrhagica appeared in this case after only seven injections of neoarsphenamine. McCarthy and Wilson (1932) reported the average number of injections of arsphenamine in such cases to be twenty-three. In the present case increased capillary permeability was associated with thrombocytopenia but not related to any deficiency of ascorbic acid. Leucopenia and necrotic angina are usually regarded as grave signs, but here the prognosis was less grave, probably because of the relatively high proportion of granulocytes in the circulating blood and in the sternal-marrow smear. It is of interest that the severity of the necrotic process in the throat was not in proportion to the granulocytopenia. The blood-counts showed a normocytic anæmia, and examination of the sternal-marrow smear revealed a picture of blood regeneration. There were therefore no signs of aplasia. I have found no record of hæmaturia in thirteen out of twenty-one cases reported since 1932. This symptom accordingly appears to be fairly uncommon. It cleared up quickly after vitamin-P therapy, and after a blood-transfusion there was no recurrence of skin purpura. Some days after hæmaturia and skin purpura had disappeared, retinal hæmorrhage took place. This is a rare symptom, the

only other cases reported being those described by Scarf (1934) and Stigaard (1937). In the latter case cerebral hæmorrhage was also present. As already mentioned, Scarborough and Stewart (1938) reported two cases of purpura hæmorrhagica after arsenic therapy successfully treated by administration of vitamin P. They employed a dosage of 1 g., given by mouth for approximately three days. These cases, however, were mild and can in no way be compared with the present case of severe hæmorrhagic purpura.

SUMMARY

A case of acute purpura hæmorrhagica developing after seven injections of neoarsphenamine is reported. Notable symptoms included profuse hæmaturia, retinal hæmorrhage, and necrotic angina. The blood picture was one of thrombocytopenia, leucopenia, and normocytic anæmia. There is no deficiency of ascorbic acid. Recovery took place rapidly after treatment with vitamin P and a blood-transfusion.

I wish to express my indebtedness to Dr. W. R. Snodgrass for encouragement and advice; to Dr. W. McAdam for investigating the vitamin C and bone-marrow; to Dr. T. Archibald, medical superintendent of the hospital, for permission to publish this case; and to Mr. Simmons, the chief attendant of the ward, for his care in supervising the nursing.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF EPIDEMIOLOGY AND STATE MEDICINE

AT a meeting of this section on May 24, with Dr. ALISON GLOVER in the chair, a discussion on

The Clinical Teaching of Social Medicine

was opened by Dr. N. M. Goodman of the Ministry of Health and Miss CHERRY MORRIS, lady almoner of St. Thomas's Hospital.

Dr. GOODMAN defined his use of the term "social medicine" as one aspect of preventive medicine—namely, the social factors affecting the patient's health. In some cases failure to take these factors into consideration resulted in grave errors in diagnosis, prognosis and treatment. He was not concerned with postgraduate education in public health and he recognised that considerable advances had been made in the teaching of undergraduates in preventive medicine. The "long glacial period" of air, soil and water had ended. Hygiene had been divorced from its unnatural partnership with forensic medicine. As far as he knew, however, no attempt had yet been made in this country to link up the teaching of social medicine with the individual clinical case, as had been done in other countries. Dr. Richard Cabot had begun this practice in Boston as long ago as 1905 and his work had spread widely in the United States. It had been instituted at Yale, Johns Hopkins, Vanderbilt, Syracuse and Louisville universities. The coöperation of a social assistant was required and in this country the almoner appeared to be the person of election for this task. In the States this teaching took the form either of a study of a selected case by the clinical teacher, social assistant and student or by the participation of the social assistant in the ward round. At Brussels Dr. René Sand demonstrated cases selected from the point of view of their social aspects and at other places on the Continent, notably at Nancy, clinical teaching was closely linked with social medicine. Dr. Goodman looked forward to a time when the notes of the social assistant or almoner would be considered a necessary adjunct in all cases admitted to hospital.

Miss CHERRY MORRIS urged the importance of social-mindedness in the doctor, both to the community and to the individual. She cited tuberculosis and orthopædics as spheres in which coöperation had been achieved and discussed the methods by which a social outlook and a knowledge of the social services available might be instilled into the student. The almoner might be included in the ward round but this was wasteful in time. As much weight should be given to the social history as to the reports from other special departments. A textbook was required as an ancillary to clinical demonstrations and discussions. The almoner's work had two aspects—the administrative and the medico-social—and it was unfortunate that a recent circular of the Ministry of Health had drawn attention to the value of almoners in the E.M.S. for the assessment and collection of payments but had not mentioned their value as ancillaries to medical treatment. The almoner's department was not a dumping ground and it depended on the medical profession whether the medico-social aspects of almoner's work could be retained in the economic conditions which would doubtless result from the war.

The PRESIDENT wondered whether postgraduate education in social medicine could not be given. He thought the need was all the greater because that invaluable insight into social conditions given by obstetric work "on the district" was no longer available in some hospitals. Inquiries in the house by a trained social worker were essential in many investigations in school medical work, for example in inquiries into nutrition and tonsillectomy.

Sir WILSON JAMESON thought that perhaps something more was needed than the plan put forward by Dr. Goodman and Miss Morris. Changes in the curriculum and the establishment of a department of social medicine should be attainable objectives. The students wanted instruction in these subjects and knew they were not getting it. Perhaps they should receive it before they went into the wards and fell into the consultant's hands. It was not so much the filling of a gap in the curriculum as a new direction or twist which was required.

Dr. LEWIS GLOVER considered that selected general practitioners should teach these subjects and Dr. CLARK

drew attention to the work of Sir Robert Philip at Edinburgh in this field.

In reply, Dr. GOODMAN said he felt that both forms of attack, those suggested by Sir Wilson Jameson and by himself and Miss Morris, were needed.

PADDINGTON MEDICAL SOCIETY

AT a meeting of this society on May 21, with Dr. SAUL CROWN, the president, in the chair, the hon. secretary read a paper on

Epidemics in War-time

communicated by Dr. C. J. DONELAN, of the Ministry of Health, who was unable to attend.

War, he wrote, with its difficulties of administration and its periods of confusion, brings an increased risk of the introduction of infectious disease from outside a country. Every unusual assembly of people is necessarily exposed to the dangers of infection, and lack of food, exposure, fatigue, excitement, anxiety and other hardships reduce resistance. Sanitary problems increase as large bodies of troops, prisoners and refugees are obliged to remain in one place. Although the attention of commanders must be chiefly directed towards military operations, yet military interests compel them to attend to the prevention of disease. In most, if not all, the campaigns of history the decisive factor was the scythe of disease rather than the sword of the warrior. The real conquerors of Rome were not the Goths and Vandals but malaria and the plague, which ravaged it for many centuries. In 1345 the Tartars carried to South Russia the Black Death—probably bubonic plague—which travelled by sea to Genoa and then gradually through France and the Low Countries to England. Syphilis was spread through Europe when the dissolute followers of Charles VIII were disbanded in 1494. In 1490 there appeared at Granada a spotted disease known then as "El Tabardillo"; this was the first appearance of typhus, "the red cloak," which has ever since been one of the dreaded concomitants of armies. In 1552 Charles V was obliged because of it to raise the siege of Metz, and his failure to subdue that city saved France from destruction. The Thirty Years War spread various epidemics over Europe, and some countries lost half or three-quarters of their population. Typhus assailed Napoleon's armies again and again: the French army is said to have lost in Spain 300,000 men from disease and 100,000 from enemy action. Prisoners conveyed far into France carried the disease wherever they went. The British force which hovered indefinitely for a period at Walcheren in 1809 was decimated by malaria. The French army which retreated from Moscow was terribly afflicted by typhus, and its stragglers spread the disease all over Germany.

In the first winter of the Crimean war the British army lost through preventable disease over one-third of its strength. The Federal army in the American civil war lost 186,000 men from disease and 93,000 from wounds. The enteric infections caused most of the deaths, and at least 52 per cent. of the white and 83 per cent. of the coloured troops contracted malaria every year. In the Franco-Prussian war of 1870 the French army was inadequately vaccinated, and the troops billeted in the homes of civilians spread smallpox through the civil population. In the resulting epidemic over the whole of France the deaths reached a quarter of a million. The German army in France, which was comparatively well vaccinated, suffered only to a small extent, but the troops which remained in Germany and the civil population, which were less well vaccinated, contracted the disease from French prisoners. A more severe and extensive epidemic than any which had afflicted the country before carried away about 170,000 persons. The internment of soldiers in Belgium and Switzerland, and the communications of Austria with Germany, caused extensive epidemics in those countries also; Italian volunteers brought the infection back to Italy from France, and the deaths in England in 1870 and 1871 were ten times those of previous years. Epidemics were also started in Scandinavia and America.

The Franco-Prussian war marked approximately the conclusion of the old order of things, and from then onwards medical knowledge of the cause and prevention of disease grew apace. In the Boer war, however, infectious diseases, particularly the enteric fevers, played an important part, and in 1900 and 1901 the British army lost, out of a standing total of about a quarter of a million, 11,000 men from disease and 6000 from wounds. The war of 1914–18 really showed how much medical knowledge could do to weaken the association between war and disease. The chief measures in the vigorous campaign against intestinal infections were prophylactic inoculations, strict water control, and a vigilant search for carriers. Although the ration strength of the British Army began at 270,000 and finished at two and a half million, there were only 6907 admissions for enteric fevers and 216 deaths. Apart from a sharp epidemic in 1916 in Mesopotamia, there was remarkably little cholera in the eastern campaign. The historic epidemic of the last war was that of malaria in Macedonia in June, 1916. The army had to advance up the Struma valley, a broad plain full of mosquitoes in which every man counted his daily bites by the score. For a time the weekly evacuations ran into four figures, and the epidemic never wholly subsided. In 1918 the incidence was 370 per 1000. Malaria was carried to England and spread where anophelines were plentiful. Local outbreaks of dysentery, chiefly caused by the Shiga organism, were reported, and an appreciable increase of dysentery carriers occurred in the population.

Typhus and trench fever, both louse-borne diseases, only spread among populations afflicted by famine and misery. In the autumn of 1918 a number of cases of typhus occurred among gypsies in the south of England but none in the population among whom they moved nor in the institutions to which they were admitted. The Rumanian army and population, in which hygiene was defective, were ravaged by epidemics. Smallpox was introduced into this country by a few British soldiers but was smothered by prompt action. It may occur in persons who contract it abroad and arrive during the incubation period. There is occasionally some doubt over the official means for securing vaccination in a district in which smallpox has appeared. Lymph is supplied from the Government Lymph Establishment at Hendon both to public vaccinators and to medical officers of health. Dr. Donelan emphasised the importance of prompt notification and of tracing the movements of the contacts of any smallpox sufferer or suspect. Greater medical knowledge did much (he said) during the last war to free war from its associations with pestilence, but medical pride was promptly humbled by the great pandemic of influenza which in a few months destroyed more lives than had been lost in four years of destructive war. The lesson it taught, summarised in the official report, is that in large collections of men herded together there are opportunities for that modification of the materies morbi which make it apt to conquer the world. In the countless incubators provided by garrisons, factories, and overcrowded means of transport and places of entertainment the organism develops destructive powers which give it a decisive and overwhelming victory.

On the potentialities of the present war for the spread of disease, Dr. Donelan continued, it is possible only to speculate. Organised evacuation, as Dr. J. A. Glover showed in his presidential address to the section of epidemiology of the Royal Society of Medicine (THE LANCET, April 13, 1940, p. 693) has not increased the incidence of infectious disease, but the figures actually show a considerable improvement. Cerebrospinal fever reached an exceptionally high incidence early this year from some unknown cause.

It is necessary to steer a careful course between optimism and pessimism. The great weapons of the medical profession are unceasing vigilance, prompt action, the greatest possible medical knowledge and its speedy application. Medical practitioners must do all in their power to dispel popular ignorance and obtain for the people the best possible hygienic conditions.

The PRESIDENT remarked that Dr. Donelan's paper did not mention any history of infection by the meningococcus. He wondered whether past wars had produced any great increase in infectious diseases of the nervous system, such as encephalitis. There has been a sudden flare-up of dysentery, he said, during the last few years, and the coming summer may show unusual figures. The German government made vaccination for diphtheria compulsory, and he considered that every child should be inoculated against it. The danger is so great that no slackness must be allowed. The Italian invasion of Abyssinia showed how efficiently an army can be protected by good medical services.

Dr. N. LEVITT said that epidermophytosis caused much disablement among the Italian troops. He saw a far greater need for prompt action and vigilance than the authorities seem, in his opinion, to recognise. Typhoid has broken out, he said, in Rotterdam and Amsterdam through the infection of water-supplies due to bombing, and refugees have already entered this country from those areas. The authorities should insist on compulsory vaccination against typhoid and smallpox and the immunisation of children against diphtheria and scarlet fever. If the Ministry would provide the necessary supplies, the practitioners would doubtless give their services without charge.

Dr. ELEANOR REECE pointed to the present large proportion of unvaccinated persons and the danger of a bad epidemic of smallpox.

The meeting resolved, in thanking Dr. DONELAN for his paper, to express their opinion that there exists an urgent necessity for propaganda amongst the civil population on the need for prompt inoculation against the enteric fevers, vaccination against smallpox, and the protection of children up to twelve against diphtheria; and for the placing of material at the disposal of doctors.

BRITISH PSYCHOLOGICAL SOCIETY

AT a meeting of this society on May 22, with Dr. DENIS CARROLL in the chair, a discussion on

Anorexia Nervosa

was opened by Dr. S. W. PATTERSON. In 1873, he said, Sir William Gull gave the name to a peculiar condition mostly affecting young women, though occasionally seen in men, with no apparent lesions in the pulmonary and abdominal organs. The patients complain of no pain; they have shrunken abdomens, great emaciation and apparent weakness, and a peculiar restlessness difficult to control. All the symptoms can be explained by the anorexia, which leads to starvation, depression of all vital functions, amenorrhœa, slow pulse and slow breathing. There is no gastric disorder, and Gull therefore believed that the origin is central and not peripheral, but the patients do not show the common symptoms of hysteria. It is dangerous to let the starvation continue, and Gull quoted one case of death from starvation alone. Little has been added to Gull's classical description except the biochemical details of malnutrition, the low blood-pressure, the growth of downy hair on the limbs and the non-involvement of the breasts in the general wasting.

Total absence of appetite is the characteristic feature. Appetite is the desire for food and is a pleasant sensation, in contrast to hunger which is the need for food and unpleasant. Appetite, moreover, depends on constitution and education; civilised people are accustomed to eat without hunger —eating is a habit, a conditioned reflex. Appetite is excited by joy, by the preparation of food and by meal-times; it is inhibited by anxiety, grief, fevers and affections of the digestive tract. The adult human is omnivorous and finds a monotonous diet unappetising, but infants live on milk for months and when they come to take a mixed diet may rebel against adult food. Many children are lazy about chewing. Taste for parsnips and other strongly flavoured vegetables may develop late in life, and many children will take fats with a low melting-point, such as butter and cream, but reject those with a higher melting-point, such as meat fat. This is probably an instinctive refusal which should be respected. Loss of appetite in children of 3 or 4 years has often been associated with indigestion, constipation and overfeeding, but it may merely be that the child is unable to take adult food. The single child who feeds with his mother is apt to trade on his peculiarities, and some children who are checked and punished at meals become frightened. The old physicians used to treat the mother, giving her a careful dietary and time-table for the child, so that she felt she had to undertake a task on his behalf —not merely that she was responsible for making him difficult. Nowadays anorexia in adults is approached from various aspects—psychological, organic, endocrinological or as an example of vitamin deficiency. Gastritis, chronic constipation and "chronic appendix," whatever that may be, have been blamed. Simmonds's disease is undoubtedly due to pituitary involvement, and has nothing to do with anorexia nervosa. Lack of vitamin B affects the appetite in animals, but in anorexia nervosa the trouble may be a failure to get enough vitamins of any kind. In a series of 273 cases Dr. Patterson has found local causes of anorexia (peptic ulcer, atrophic gastritis, gastroenterostomy, alcoholic gastritis, carcinoma) in 63; reflex causes (disease of the colon, rectum or gall-bladder) in 33; toxic-infective conditions in 109; and nervous causes (psychosis, strain or anxiety) in 68. He classes those in the last group as anorexia nervosa. Treatment includes correction of the starvation state, isolation, discussion of difficulties, and adjustment of the patient and her environment. Treatment should be long and cases should be followed up. Most patients recover. In conclusion Dr. Patterson asked what is the relation of the amenorrhœa to the psychological and nutritive factors; in what proportion of cases does conduct become normal when weight increases; what is the frequency of troublesome anorexia, less severe than anorexia nervosa, apart from organic illness; and what relation has anorexia nervosa to the feeding inhibitions of infants?

Dr. W. C. M. SCOTT said that the man in the street, the mother in the home and the baby in the cradle have definite views on food, and they have arrived at their opinion without real knowledge of food and partly biassed by the way they were first fed. It is not easy to approach a patient with a feeding difficulty without experiencing some bias ourselves; we cannot remain unaffected by a patient starving in the midst of plenty, and protectively try to make the patient eat as we do. Gull described in these patients a dislike of food and an occasional voracious appetite. Such swinging of symptoms is characteristic of manic-depressive disorders. Gastro-intestinal disturbances not mentioned in the original description are manifold and various. Recent writers imply that all patients should be cured, but Ross reported 6 relapses and 1 death in 19 patients treated in ten years, and Ryle found that of 37 patients seen during

sixteen years 10 did not improve or relapsed, 4 of these dying. To give concentrated foods is to play into the hands of the patient, who already wants to live on air. The disorder has been called an addiction to meagreness; the cure may take the form of an addiction to an adequate diet, which is hardly the proper basis for feeding habits. Normal feeding should not be compulsive. Hurst holds that the patient should be told that the appetite has been lost by not eating and should be persuaded to eat. He claims to have treated 50 patients in this way during nineteen years without a single failure. Such good results suggest different standards in diagnosis. When the psychologist encounters a so-called good therapeutic result he has to ask himself whether it enables him to understand the details of the problem seemingly solved, or whether a new defence has been built up by the patient when the symptom disappears. Undoubtedly a point comes, with some patients, at which psychotherapy alone cannot cure them—they must be fed or they will die—but it was also true that a point may come when they would die if treated solely by the giving of food. Moreover, anæmia and beri-beri may complicate the picture, and these may be cured without altering the mental picture. Ryle considers that the neurosis runs true to type and should be distinguished from other neuroses. The patients are reticent and rarely see psychiatrists. A series of 117 patients seen at the Mayo Clinic in thirteen years were described as preoccupied, apathetic, reticent and negativistic, yet they aroused the sympathy of general physicians which suggested that they were of the manic-depressive type. It is difficult to imagine physicians being interested in 117 preoccupied, apathetic, reticent and negativistic patients if they were mild schizophrenics. Weizsaecker described the cases of two female patients who had occasional days of voracious eating; he studied their dreams and concluded that before eating they dreamed of their mothers, of bodily disintegration or death; whereas before starving they dreamed of their fathers, of God, knowledge and well-being. He gave no specific interpretation but suggested that the anorexia represents one of the ways in which patients may deal with conflicts about the relationship to mother and father, imprisonment and freedom, pregnancy and sterility, life and death.

Dr. Scott went on to describe three patients of his own. Two of these were women in middle life who had had to cease work owing to hypochondriacal symptoms; and both, during adolescence, had had loss of appetite and weight with cessation of menstruation. Only during treatment of the later illnesses did they admit that the adolescent anorexia had followed a sexual episode with a relation; both had believed themselves pregnant—both had starved in the hope of preventing the growth of the child. The third patient was a woman of 24 who developed the symptoms of anorexia nervosa and followed them up with depression and suicidal tendencies. It turned out that during adolescence she, too, had imagined herself pregnant following an episode with a relative, and had had anorexia and amenorrhœa for a few months; and that some of her anxiety in her later illness centred round the idea that she contained a dead baby. Ryle has said that psycho-analysis may do harm in anorexia nervosa, but gives no evidence for the statement. Psycho-analytic treatment can be carried on at the same time as medical and nursing supervision of the diet. Psycho-analysts have found that eating difficulties both in young children and adults are related to early anxiety situations of the paranoid type. Patients equate food with loved or hated objects, and, when eaten, with organs in the body, and this may give rise to fears of being poisoned or destroyed. Motives of unconscious sacrifice may also enter into feeding difficulties. Dr. Scott maintained that in the study of anorexia nervosa psychiatry has as much to contribute as clinical medicine. Physiologists should help us to understand the low temperature and blood-pressure and the slow pulse, the poor peripheral circulation, the menstrual variations, the occasional anæmia and leucopenia and the other gastrointestinal disturbances. The endocrinologists and experts on nutrition should try to explain the emaciation, the downy growth of hair, the pigmentation, and any ovarian, thyroid, adrenal and pituitary disturbance.

The CHAIRMAN said that his cases have been so negativistic that he has considered whether they were schizoid. He too has been puzzled by Ryle's dictum; he is not aware that sufficient cases have been treated by psycho-analysis to show whether this treatment is harmful or not. He has known cases to be very resistant to psychotherapy, but as far as he knew no harm has come of it. The classical method of dealing with the patients is often remarkably successful, but we need to know the state of mind of the patient at the end of treatment; if she was a hysteric to start with, was she still a hysteric at the finish? If so, this implies no criticism of the treatment; it merely helps us to understand the facts.

Dr. E. B. STRAUSS asserted that anorexia nervosa is a definite clinical entity which can be studied from the typological point of view. He restricts the concept to adolescent women of asthenic physique who show signs of physical infantilism, sometimes with an infantile type of uterus and psycho-sexual infantilism. The downy hair on the limbs can be regarded as equivalent to persistent lanugo hair. There is loss of appetite, but the patient does not complain of it. Indeed, she does not complain at all; she leads an exceedingly active life and says she feels well. The picture only becomes confused if other types of feeding difficulties are classed with it. In young males severe anorexia is often associated with schizophrenia or manic-depression; in children it is often due to hysteria, the motive being secondary gain. The patient with anorexia nervosa rarely has any strong motive of secondary gain, and so far from being a hysteric, she is only too anxious to retire into the background. The elderly woman with anorexia is psychotic or hysterical, depressed or fearful. In true cases of the condition, Dr. Strauss has almost invariably found a masculine protest coupled with the fear of assuming adult responsibilities; and there is nearly always a dominant mother figure against whom the patient feels rebellion. Physical methods of treatment are invariably successful provided the physician becomes identified in the patient's mind with *benevolent* authority. Otherwise forced feeding can prove fatal.

Dr. H. V. DICKS mentioned the pitfalls of the diagnosis, referring to one case of supposed anorexia nervosa which turned out to be acute yellow atrophy of the liver, and another which responded to treatment and then developed dementia paranoides. In one case, however, investigation showed that the anorexia was a defence against the idea of eating fæces; fæces in this case were regarded as "goodness," to be retained. When this interpretation was made clear the patient recovered.

Dr. MARGARET LOWENFELD drew attention to the relation between feeding difficulties and asthma and eczema. Adolescent patients with anorexia sometimes find it difficult to think of themselves as separate from their own bodies, and they can often express their experiences better by modelling in some play-material like Plasticine than in words. Food often becomes personified into an attacking figure which it is virtuous to resist, especially if it looks nice; in such cases it is sometimes worth while giving unattractive food.

Dr. D. W. WINNICOTT said that feeding disturbances in children are so common that one may almost say that it is the child without a feeding difficulty who is abnormal. One group stands out from the rest—that in which the child's failure to eat makes the mother ill. In these cases the patient is the mother. The child feels that by not eating he is making a psychological advance and achieving independence. It is always possible to give the cause of anorexia in infantile terms, and we should not be led into invoking such things as pregnancy phantasies even to explain amenorrhœa.

REVIEWS OF BOOKS

Clinical Practice in Infectious Diseases

By E. H. R. HARRIES, M.D. Lond., M.R.C.P., D.P.H., medical superintendent, North-Eastern Hospital, L.C.C.; and M. MITMAN, M.D. Lond., M.R.C.P., D.P.H., D.M.R.E., medical superintendent, River Hospitals, L.C.C. Edinburgh: E. and S. Livingstone. 1940. Pp. 468. 17*s.* 6*d.*

CONSIDERING the fundamental changes that have lately taken place in our approach to infectious diseases and specific methods of control, the output of authoritative textbook guidance on the subject has not been great, and the collaboration of Dr. Harries and Dr. Mitman at this time when efficient control of infectious diseases may be of vital national interest is particularly welcome. Their book has several unusual features. Almost a fifth is taken up with preliminary general considerations—immunity processes, general methods of spread and control, diagnosis and management of infectious diseases, and particularly the management of common complications such as bronchopneumonia and infections of the middle ear. This section makes for a better appreciation of the individual diseases and avoids tiresome repetition later. The rest of the book is on more conventional lines. There is, however, an orderly grouping of diseases having a closely allied ætiology or tending to affect the same systems of the body which has much to commend it, particularly from the medical student's point of view. In addition to the commoner infections, space has been allowed for rarer conditions such as epidemic louse-borne diseases, the importance of which under war conditions may be readily imagined. In the last chapter explicit and helpful advice is given on the control of infection in hospitals, particularly in children's wards—a subject on which textbook guidance is too often vague.

In general the views expressed closely reflect modern fever-hospital practice but there are exceptions. Few would disagree with the total dose of 30,000–100,000 units of antitoxin recommended for severe diphtheria, but its administration *wholly* by the intravenous route raises practical difficulties not easily overcome. Most authorities are content if a reasonable proportion of the amount is given intravenously. Again, some will contend that the admixture of antitoxin with glucose or glucose-saline before intravenous injection does not minimise the risk of unpleasant reactions; quite the reverse. But even if readers disagree with some of the advice given they will admit that the available evidence has been fairly weighed. The authors have preferred line and colour diagrams to imperfectly produced colour plates and these do illustrate their points admirably. On the other hand, some of the simpler tabular comparisons might be omitted. Occasionally there is an impression of over condensation, particularly in the sections on treatment, but nothing of proven value has been left out.

Principles and Practice of Aviation Medicine

By HARRY G. ARMSTRONG, B.S., M.D., captain, Medical Corps, United States Army; director, aero medical research laboratory, Air Corps Material Division. London: Baillière, Tindall and Cox. 1939. Pp. 496. 36*s.*

THIS book, which is the only modern comprehensive work on its subject, is written so as to give the maximum of information without waste of words. There are occasional flaws in the English but none in the presentation, which is logical and lucid. It is with a kind of retrospective apprehension that one realises that so much specialised research, culminating in a mass of fact and a maze of technical problems, has been lying scattered in the literature to be rescued just in time. In another five years it would have been almost impossible for a single writer to have collected it and to have infused it with the wealth of his own experience, for it embraces diverse fields of knowledge.

The first 160 pages deal with the selection and care of pilots and the duties of the flight-surgeon. A brief but revealing historical background is supplied, and the criteria for examination of candidates are set out with perhaps too much detail, for the most important and least ponderable are psychological. The remainder of the book is nearly all given up to the physiological difficulties encountered in actual flight and includes a number of original observations by the author. Physiologists are familiar with the fundamental problems of life at high altitudes, as investigated by Paul Bert, Haldane, Barcroft and others, but aviation presents some of its own—those of equilibration and orientation, those arising from accelerations, "aeroembolism" due to rapid ascent, and many others. The older problems centred round anoxia become incredibly complicated by the requirements of practical aeronautics. Air sickness, acute and chronic altitude sickness, and "aeroneurosis" receive full and sympathetic treatment, giving the imaginative reader a moving insight into the strain to which military and professional flyers are subject. Captain Armstrong's attitude is one of sound common sense and is clearly based on wide personal experience, both clinical and experimental, and on a familiarity with the technical requirements of aircraft. His views on the future are of great practical interest.

Hygiene of Marriage

(8th ed.) By ISABEL EMSLIE HUTTON, M.D. Edin. London: William Heinemann (Medical Books). 1940. Pp. 152. 5*s.*

THE family doctor can safely recommend this book to men or women contemplating matrimony. Though the style is a trifle stilted and the author's outlook perhaps a little old-fashioned, the information and advice she offers are sound and up to date with one rather serious exception. Dr. Hutton states repeatedly that ovulation usually takes place immediately after the cessation of the menses, so that in her opinion fertility is at its height during the post-menstrual week and the "safe period" lies between the 8th and the 26th day. This is completely at variance with modern teaching. Dr. Hutton is not concerned only with the preparation for marriage and its consummation, she also discusses menstruation, the climacterium, sterility and contraception. She is a strong advocate of family life and the rearing of children, and it is therefore a little surprising that in her otherwise excellent chapter on "childlessness" she does not mention the possibility of adoption in cases of irremediable sterility.

Green's Manual of Pathology

(16 ed.) By H. W. C. VINES, M.D. Camb., director of the Charing Cross Hospital institute of pathology. London: Baillière, Tindall and Cox. 1940. Pp. 1166. 31*s.* 6*d.*

THE increasing fatness of textbooks is said to be evidence that official teaching still prefers a mind overburdened with facts to disciplined thought, but here Dr. Vines has wisely used many of his extra pages to show the essential unity of physiology, pathology and the clinical subjects, and to point out

that disease is a continuous process. The careful description and helpful series of photomicrographs on the development of the tuberculous follicle is a good example of how this continuity can be successfully brought home to students. The division of the subject into general pathology and the special pathology of organs in relation to clinical medicine is retained but the chapters on pure bacteriology and parasitology have been replaced by brief accounts of the diseases caused by infective agents. The new descriptions of the repair of tissues and of the general characters of tumours sum up well the important facts, and the newer classification of diseases of the reticulo-endothelial system is simply and clearly described. The book contains such accurate and up-to-date detail that it is surprising to find no mention of Jacobson's work on the argentaffine cells in pernicious anæmia and to find vitamin still spelled with a terminal "e," while the heading "Carcinoma of Blood" on page 731 is an unhappy misprint. The student will find in this abundantly illustrated and eminently readable textbook all the pathological information he is likely to need.

The Virus: Life's Enemy

By KENNETH M. SMITH, F.R.S. Cambridge: University Press. 1940. Pp. 176. 7*s.* 6*d.*

THE popularisation of science is an important but exacting labour, more especially when the subject discussed is both abstruse and rapidly expanding. Dr. Smith, however, who is admirably equipped for the task, has written a book which will meet with the approval of both the layman and the specialist. The book is divided into two parts: the first deals with the nature of the virus, the second with the virus in action. In discussing the growth of the virus concept Dr. Smith quotes a letter from Jenner on the genesis of herpes simplex and its relation to other infections. Curiously enough, almost exactly similar views are expressed by Shakespeare in "Romeo and Juliet." Too much praise perhaps is given to Athanasius Kircher, who, it is now thought, was a forerunner not of van Leeuwenhoek but of Baron Munchausen. The methods of spread of animal and plant viruses and of the relationship between viruses and cells are very fully discussed, but it should be made clear that the theory that viruses are highly specialised parasites which have developed parasitism to its utmost extent was originally put forward by R. G. Green, as Laidlaw himself was the first to acknowledge. Otherwise, it may be objected that trench fever is not usually regarded as a virus infection, that no distinction is made between the work of Etienne and F. M. Burnet and that the index is inadequate. Nevertheless, a vast amount of information is accurately and pleasantly conveyed in a style singularly free from scientific jargon. No-one will quarrel with Dr. Smith's sense of frustration in that while the nations pour out their treasure to produce armaments against each other, the real enemies of mankind are still unconquered.

Pathogenic Microörganisms

(11th ed.) By W. H. PARK, M.D., late professor of bacteriology and hygiene, New York University college of medicine, and director emeritus of the bureau of laboratories of the department of health of New York City; and A. W. WILLIAMS, M.D., former assistant director of the bureau. London: Baillière, Tindall and Cox. 1939. Pp. 1056. 40*s.*

THIS edition was prepared for the press shortly before Dr. Park's death. It retains the general form and character of the previous edition, but has been thoroughly revised. Two new chapters have been added—one on bacterial metabolism by Dr. K. C. Blanchard and the other on bacterial variation by Dr. Philip Hadley. The book sets out to give a theoretical account of all classes of pathogenic microorganisms, including the pathogenic yeasts, moulds, fungi and protozoa, as well as the bacteria proper, and also to provide a generous amount of technical instruction. It is inevitable therefore that it should in places be over-dogmatic and incomplete. The tabulated information introduced is sometimes rather misleading. For instance, the tables which compare anaphylaxis with allergy convey an impression that anaphylaxis is exclusively an animal phenomenon and allergy a human one, this being the chief difference between them. The account of the subject in the text is more orthodox. The sections on immunity are strictly traditional, and will appeal chiefly to students who are not primarily interested in the recent theoretical development of the subject. The book is illustrated with 247 engravings and 13 full-page plates. Each chapter has a bibliography and there is a good index.

Quarterly Journal of Medicine

The April issue contains the following papers:

NITROGEN AND CHLORIDE METABOLISM IN GASTRO-DUODENAL HÆMORRHAGE. By Douglas Black and Arthur Leese (Oxford). Detailed studies of nitrogen balance, chloride balance, and other biochemical aspects of three cases of severe gastro-duodenal hæmorrhage led to the conclusion that the increase of blood-urea in this condition is probably due in the earlier stages to increased tissue breakdown, and is contributed to later by absorption of nitrogen from blood in the intestine and by impairment of renal function. Chloride output in the urine is usually low. These findings point to the need for giving ample water and salt to such patients, as well as for feeding them in the more liberal manner now widely approved.

GALACTOSE TOLERANCE AS A TEST OF LIVER FUNCTION. By N. F. Maclagan (Westminster Hospital). Blood-galactose is estimated four times in two hours after giving 40 mg. galactose by mouth. The values in mg. per 100 c.cm., added together, are called the galactose index. In fifty normal subjects it lay between 3 and 163 (average 68). In six cases of diabetes and six of obstructive jaundice it was normal. In all of ten cases of toxic jaundice it was above 163. It was also above normal in ten out of twelve cases of severe hyperthyroidism. The test therefore promises to give a sharp differentiation between toxic and obstructive jaundice.

NEW OBSERVATIONS ON THE ÆTIOLOGY AND PROGNOSIS OF ACHRESTIC ANÆMIA. By M. C. G. Israëls and John F. Wilkinson (Manchester). The authors report six new cases of primary macrocytic anæmia, in which free hydrochloric acid was present in the gastric secretion, and the response to liver therapy was poor or variable. In biopsy specimens of sternal marrow they found megaloblastic hyperplasia closely resembling that of pernicious anæmia. The authors therefore defend their thesis that this is a distinct variety of anæmia, due to partial failure of the bone-marrow to utilise anti-pernicious-anæmia liver principle which itself is normally produced and stored in the patient's stomach and liver.

ALEUKÆMIC LEUKÆMIA. By Martin Hynes (Middlesex Hospital). Cases are described of acute and chronic leukæmia, myeloid and lymphatic, in which the white-cell counts did not exceed normal. Their diagnosis and differential diagnosis are discussed. Most reported cases of "aleukæmic myelosis" are held to have been probably examples of myelosclerosis.

A REPRINT has been published of the first edition of the "Textbook of Medical Treatment" by various authors, edited by Prof. D. M. Dunlop and Prof. L. S. P. Davidson of Edinburgh and Prof. J. W. McNee of Glasgow (Edinburgh: E. & S. Livingtone. 25*s.*). The whole book has been revised and the newer advances in chemotherapy are included. A section on the use of sex hormones by Dr. T. N. MacGregor has been added at the end and there is now a full account of the treatment of alcoholism and drug addiction.

THE LANCET

LONDON: SATURDAY, JUNE 1, 1940

TWO WAYS

THE world is split into two camps, though some do not yet realise it. Not merely two nations but two modes of life are in conflict: shall we simple people give our lives, our liberties, our very thoughts into the hands of a Leader, endow him with an omniscience transcending human capacity, put at his disposal all that is most loving and most ruthless in ourselves and let him choose what shall be our good things and who shall be our enemies? Or shall we follow in the ways of our forefathers, and with painful misgiving, with hope in the growing wisdom of the masses, and with tolerance for all kinds of human foible and failing, strengthen the deep-founded but ever-changing structure of our democratic state? The present moment is a nodal point; we cannot put off the decision, the stern laws of fate compel us and allow of no delay. The words that are so seldom apt in the shifting pattern of compromise in which we live are now our battle cry: "He that is not with me is against me." A battle is within earshot which may decide our personal fate and the destiny of our culture, whose result may put within our power a reign of peace or bring slavery to us and to our children, but we may even now, as always, draw strength from a better understanding of what goes on in our own mind and that of those who oppose us.

This struggle between two ways of life that express themselves as totalitarianism or democracy will not be finished, nor did it begin, in Flanders. The question "How does a nation get into the state of mind of the present Germany?" cannot be answered without considering how we western people have developed our present culture. It is not enough to say that the German enjoys the experience of submission, particularly if his ruler is playing the bully to someone else; there is in addition a pleasure in having the whole of his life organised for him down to the last detail. If all Germans are at any given moment doing the same things and thinking in the same way it gives him the illusion that everything in his own mind is being conducted in an orderly way: doubt is quenched, anxiety is diminished, he is untroubled by his inner feelings, guilt is allayed. The exact ordering of external life is a kind of occupational therapy which reduces the painful apprehensions arising from internal stress. By his deification of the leader and the state, and his contempt for all other people, the German tries a short cut to the solution of the problem of evil. Differing opinions held between fellow nationals is felt to be dangerous because mutual confidence, which springs from tolerance of difference, is lacking. But the strength which comes from the crude dichotomy of good within and evil without is brittle because it is based on a denial of the truth, though for a time it may be strong in deeds. It breaks when its action is delayed or frustrated, because the whole structure of belief is based on the omnipotence of the leader and the state. Even temporary failure is a menace to that peace of mind—that armistice of inner conflict—which denies humanity and human rights to foreigners, for delay in the attainment of success may show that fate is an avenger of wrong. It is idle to think that the enemy is exempt from guilt because he is so barbarous; on the contrary, he must continue his barbarity lest he be overtaken with painful misgiving and even remorse; these feelings which he stigmatises as decadent must be kept from his consciousness and their influence on his life denied. Our adversaries have chosen a way of resolving their own difficulties which has plunged the world into misery, and their evil designs are furthered by traitors who criminologists tell us are never people with an easy mind. In the democratic countries there is unity of purpose only in the face of great danger; at other times satisfaction is felt in the diversity of interest and aim. If nearly everyone has his own opinion we regard the fact with pleasure. "It takes all kinds to make a world" and the world so made seems to us full of richness and to be a mirror of the countless impressions and aspirations which we cherish within us. If all men thought alike we should lose the external counterpart of our varied inner moods, for it seems that we need to meet another point of view both to sharpen our wits and soften our arrogance. The diversity of man is a reassurance to us that we can hold a different view from our neighbour without hatred and can yield to him without a sense of humiliation.

Liberty can only be bought at the price of vigilance. The concentration of aggressive power in the hands of a few men, which science has made possible, favours the totalitarian countries in the first phases of warfare. A few men can spring a surprise, a multitude never can. What is remarkable is that the people in the democracies were so blind to the danger. If analogies with the working of the individual's mind are any guide to national behaviour one would think that we did not arm gun for gun and plane for plane with Germany because we did not disarm twenty years ago when that country surrendered her fleet and disbanded her army, and we did not recognise her craving for vengeance because we have not been able to remove from our minds, though we may have wiped from our memories, the starvation of that people between the armistice and the signing of an unnegotiated peace. But the savage stab at England which the enemy intends and has already begun puts past confusions and mistakes into the background. This island and our generous and easy tradition of life are objects of the enemy's desire and of his hate. We too are forced to be a military nation and to focus all power in the hands of a few men. Some view this act with foreboding,

saying that we have turned totalitarian to fight totalitarianism. This is a confusion of thought which we and the neutral countries should be clear about. To us CHURCHILL is a man not a god; we gave him great power the better to fight for the freedom of a country and a tradition that we and he love. He does not mould our way of life but we let him guide such of our actions as will serve our common ends. When power is given it is not misused; when power is seized let the world beware. Germany has devised the weapon of total war and in the process has become a destroyer of much that gives life value. Our aim will not be achieved unless we can assure to ourselves and to our children a victory in the all-in struggle for a "total peace": a way of life in which the common man can live his life fully, devoting himself to his own good purposes in the service of those he loves.

HOMŒOPATHY INVITES CRITICISM

A HOMŒOPATH, most of us would say, is a weird sort of doctor who believes that the smaller the dose in which a drug is given the more powerful is its action, so he treats his patients with drugs in extreme dilutions. He is a legally qualified practitioner, and homœopathy has flourished for over a century, which is longer than the life of most forms of mere quackery. Its adherents claim that the orthodox who oppose it are ignorant of its principles as well as of its practice, and they remind us that many notable advances in medicine have been met at first with violent and unreasoning opposition. So perhaps we should look a little more carefully and dispassionately at the homœopathic claims. The publication of a second edition of Dr. CHARLES WHEELER'S "Introduction to the Principles and Practice of Homœopathy"[1] offers a convenient opportunity, for he sets forth the principles of homœopathy with the orthodox reader specially in view.

Homœopathy, says Dr. WHEELER, "is a principle of drug therapeutics: it claims to be justifiable on general grounds, but can derive final validity only from clinical experiment." Its fundamental generalisation is that the most successful drug for a given patient will be that one which produces in normal subjects a symptom-complex closely resembling that presented by the patient. This is the famous doctrine of the *similimum*—"like should be treated with like." The homœopath begins by collecting data on the effects of drugs on normal subjects, which he calls the "provings" of the drugs. This has been adequately done only for some drugs, while information about others is still incomplete. Given a knowledge of these provings the homœopath's main task is to observe his patient's symptoms, and to compare them in his mind with those associated with the several drugs of his materia medica. That is not easy, as anyone will realise who knows the variability of disease-pictures in man, and the more experienced homœopath shows his quality by a shrewder weighing or selection of symptoms and detection of parallelisms as well as by a greater knowledge of the provings. In this way the all-important choice of drug is made. Its dosage is held to be of secondary importance, for "much good homœopathic work has been done, and can be done, with tinctures and easily demonstrable quantities of drugs." Yet it is claimed as a discovery of HAHNEMANN, confirmed empirically by his followers, that minute doses of drugs gave swifter and profounder results, which endured more permanently. Hence the more experienced homœopath prefers as a rule the higher dilutions of his pharmacy, known as "potencies." These are made simply by diluting ordinary plant tinctures or solutions with alcohol and water: dilutions of 1 in 100 to 1 in 1,000,000 are regarded as "low potencies," those of 1 in 10^6 to 1 in 10^{24} are "medium," and "high potencies" range from 1 in 10^{24} up to 1 in 10^{60}. The belief in the efficacy of these infinitesimal quantities is said to be based empirically on experience; no rationalisation is attempted beyond a vague suggestion that the pharmaceutical methods in some way change the energy of the drug, and a hint that it acts after the manner of an enzyme, or through "a physical action (ethereal vibrations or whatever)." There are other considerations that influence the homœopath's choice of drug and dosage, but they are less fundamental. Once the choice is made and the drug given the patient's progress is watched. If he improves the drug is immediately withheld, and only resumed if his improvement halts. If no benefit appears the fitting of the patient's symptoms to a drug-picture is reconsidered, and trial is made of some other drug. If the drug seems to aggravate the symptoms this is likely to mean that it has been given in too concentrated a solution.

The bulk of Dr. WHEELER'S book is occupied by accounts of the provings and the uses of thirty-one drugs of the homœopathic materia medica. Sodium chloride, a substance of which the orthodox have some knowledge, may be taken as an example. To the homœopath "natrum muriaticum is one of the most profound remedies for chronic diseases and the clinical evidence of its power is extensive and persistent." In high dilution it is held to have a subtler non-osmotic influence, different from its osmotic effects in ordinary concentrations. The only statements made about its provings are these: "natrum" muriaticum produces anæmia; it produces (and cures) a definite type of constipation; young horses reared on certain salt marshes developed cataract. Otherwise no word appears, in six pages of text, on the action of sodium chloride on the normal subject, the "symptom-complex" of the substance. Yet the six pages are almost full of diverse indications for its therapeutic use, including chronic anæmia, exophthalmic goitre, migrainous headache, enuresis, hypertrophy of the heart (especially when the attacks of palpitation are aggravated by lying on the left side), malaria,

1. London: William Heinemann (Medical Books). 1940. Pp. 344. 15s.

neurasthenia and Addison's disease. There is nothing to indicate that any general principle governs these very miscellaneous recommendations.

If homœopathy purported to deal in values or processes outside the realm of science—as religion does—a scientific criticism of it would be beside the point. But Dr. WHEELER speaks in his first page of "the judgment bar of science" and obviously invites such criticism. He says that the homœopathic claims are based on "clinical experiments many times repeated"; "only experiments equally careful, equally numerous, but leading to opposite conclusions can be accepted as countervailing material." The scientist might reply that experiments less numerous but more careful and logical, in control and interpretation, might suffice to refute those claims. Two considerations, however, can deter him from undertaking to experiment. The first is that the two homœopathic principles, that of the *simillimum* and that of the efficacy of infinitesimal doses, are so incongruous with the main body of scientific principle (and remain so after 100 years) that they are unlikely to be sound. The second is that the homœopath's appeal to experience, as set forth in his own account of his own "experiments," is to the scientific mind quite unconvincing. Allow the possibility that the principles are right, surprising though that would be; the onus is then on the homœopath to record in detail the effects of his drugs on normal subjects and on patients and to demonstrate the parallelisms in which he believes. Dr. WHEELER entirely fails to do this. He pays no more than lip-service to his own fundamental principle. Until homœopathy brings evidence, as distinct from asseveration, that its remedies modify the course of disease in man medical practitioners can legitimately ignore it.

The homœopath, of course, has been trained in orthodox medicine and surgery, and practises both. His peculiar views and methods are "an addition to the physician's resources and not a substitute for any measure of proved efficacy." In the present state of knowledge, both ours and his, we may reasonably suppose either that the good effects he attributes to his drugs are part of the natural course of the patient's illness or that they are mediated by those subtler personal influences of suggestion and encouragement that accompany the tonics and placebos of orthodox medicine.

PLANTS WITHOUT SOIL

THERE is no esoteric mystery about what is variously known as hydroponics, aquaculture or water culture, but is best called soilless cultivation, in spite of the fantastic claims made for its possibilities. Nor is there anything new to plant-research workers in its principles. The soil is merely a natural vehicle which supplies and carries the materials absorbed by the roots of plants. The foremost of these materials is water; the others are various relatively simple chemical substances which to be absorbed by the plant must be dissolved in the soil water. These substances are dissociated in the water and absorbed in the form of the individual ions. The remaining requirement of the root-system is air, or more accurately oxygen, for respiration. If we can supply a plant with enough of these primary requirements at its roots without the use of soil we may expect the plant to grow as well as in its natural medium. This is what soilless cultivation aims at—the control of the supply of water, salts and air to the roots more efficiently than can be achieved in the heterogeneous system, subject to continual disturbances, which we know as soil.

There are three main systems by which we can achieve this control. The plant may be grown with its roots permanently in a watery solution of the necessary salts, but this means that we must also supply oxygen dissolved in the solution, which introduces a practical difficulty. Secondly, we may replace the soil as a vehicle by an inert material such as sand, fine gravel or even cinders and may supply the nutrient solution by merely watering it on. As the solution sinks through the "aggregate" it bathes the roots and also draws in air behind it. The excess drains away, but sufficient is left on the material for the roots to absorb their needs for some days. A great deal of valuable solution is, however, wasted in this system. The third and most economical method is to grow the plants in a coarse aggregate such as gravel contained in a water-tight trough and to supply the solution by pumping it in from a storage tank situated underneath and then to allow the surplus solution to flow back into the tank. By this method the solution is used over and over again and if chemical tests are made on it at intervals the salts absorbed by the plants can be replaced as they are used up and maintained at the correct concentration. In the United States all of these systems have been operated commercially for various crops, often with good results. Experimentation in this country has not progressed so far but at Reading University, Bakeham Farm Nurseries at Egham and elsewhere trials have been in progress for some years with several crops under the three systems. Plants can be successfully grown in any of these ways, but the third or "sub-irrigation" system seems to hold out the greatest promise for practical application in this country. There is no reason why any crop should not be grown on this system but as a paying proposition only those crops giving a high return per unit area are likely to repay the capital cost. These will be almost exclusively the plants which are normally grown in glasshouses, especially tomatoes, cucumbers, carnations, chrysanthemums and perhaps "catch-crops" like lettuces, beans and other rapidly maturing vegetables. Higher yields of crops may well be anticipated but only in so far as a greater degree of control over the plant's normal nutrition is achieved, coupled with relative freedom from soil-borne diseases. Even with these advantages the system could not pay were it not that its operations can be controlled automatically by

electricity, thus saving much in labour, and that it effects an economy in manures, sterilising and so on. Just as much or more knowledge of how to grow plants at all is however needed to grow them without soil as with it. The system undoubtedly has a future, but more experimentation is wanted before it becomes a fully-fledged partner of the age-old methods. In the meantime the more trials that can be carried out by amateurs and professionals the better.

There is not the slightest reason to suppose that the crops grown in this way will differ in nutritional value from those grown in soil. The chemical substances on which the food value of a vegetable or fruit depends are manufactured by the plant in the course of its growth and are not absorbed as such by the root; all that soilless cultivation can do is to ensure that the plants shall not be deficient in any of the elements for growth, such as nitrogen, potassium, phosphorus, calcium and the rest. But the mysterious qualities ascribed to these crops are mere moonshine invented by hopeful sellers of apparatus and chemicals.

ANNOTATIONS

SERUM IN CEREBROSPINAL FEVER

THE success of chemotherapy in meningococcal meningitis has quite suddenly relegated serum to a secondary place in treatment. Clearly chemotherapy must be employed whether serum is given or not but on another page Dr. Russell Amies pleads for a more extended trial of the combined treatment in human infections, a procedure which he regards as essentially rational. He shows that meningococcal septicæmia in mice can be treated more effectively by sulphapyridine plus serum than by either product alone, the case-fatality rate with the combined treatment being 26 per cent. as against 59 per cent. with sulphapyridine alone, 73 per cent. with serum alone, and 95 per cent. in untreated controls. It would be unjustifiable however to draw the obvious conclusion as far as human infections are concerned. Dr. Amies reminds us that the earliest use of chemotherapy in meningococcal meningitis was founded on mouse experiments but it must be said also that results far exceeded expectations. Moreover, although the accumulated data on combined treatment must by now be considerable, in no comparable series in the present epidemic has there been an improvement on the gross fatality-rate of 10 per cent. reported by Banks,[1] who used chemotherapy alone. As experience with the sulphonamide compounds crystallises emphasis is increasingly laid not only on the correct choice of preparation to meet varying circumstances but on precise dosage and early recognition of danger signals such as dehydration. Provided these details are mastered, chemotherapy alone appears to afford the patient the best chance of recovery we can offer at present. Nevertheless, serum will continue to be used, particularly in desperate cases of the fulminating type or when the patient is comatose when first seen, if for no other reason than an unwillingness to abandon a form of treatment which has proved helpful in the past. There must be no question however of reserving serum as a second line of defence to be used if the patient does not respond to chemotherapy. If any benefit is to be obtained from serum as an adjuvant it must be given immediately in a large dose (50–100 c.cm.) and preferably by the intravenous route. There is now general agreement that intrathecal administration does not offer any particular advantage but rather the reverse.

PULMONARY ARTERIAL PRESSURE

THE chief function of the pulmonary circulation undoubtedly lies in the gaseous exchange between blood and alveolar air. In his Harveian oration outlining the historical growth of this conception, R. A. Young[2] discussed some other points associated with the lesser circulation. Many of these are mechanical, and it is good mental exercise to work out the nice coördination whereby two synchronised pumps, the left and right hearts, contrive without disaster to meet the capricious demands of the peripheral circulation. Disaster, as far as the lungs are concerned, would be a brief incoördination of sufficient magnitude to denude them of blood or congest them to the point of hæmorrhage. Another point is the degree to which the pulmonary capillaries can constrict and dilate actively, for a mass movement in either direction would profoundly influence the heart and the rest of the circulation. Experiments on animals tell us that such happenings normally fall far short of the calamitous, and that in the moment of cardiac adjustment to a new circulatory condition the pulmonary reservoir may perform an important function in buffering the differential output of the two sides of the heart. Clinical observation shows, nevertheless, how the failing left heart can become increasingly dependent on increased pressure in the left auricle which can only be transmitted from the right heart via the pulmonary capillaries. The stability of the lesser circulation can be attributed in great part to its large bed and low resistance, and the pulmonary arterial pressure is as a rule placed at about a sixth that of the systemic. Brock and Spurrell[3] have for the first time measured it directly in man, confirming this order of magnitude and showing that it diminishes on inspiration and increases on expiration. It is to be hoped that they may succeed, by more sensitive recording, in registering the pulse-pressure. It is perhaps too much to hope that the limits of variation, the effects of cardiac embarrassment, the influence of high coronary flow and so forth will ever be determined on the operating-table. On the other hand it is impossible to predict what important result may not accrue from simple measurements of this kind made as opportunity serves during surgical operations.

THE DYSENTERY BACILLI

AFTER a mighty expenditure of labour Colonel Boyd[4] has brought order out of the chaos of organisms which may cause bacillary dysentery. His results are based on the isolation of a very large number of organisms in the military laboratories of India. In order to obtain criteria of pathogenicity the stools of 93,000 menials in India, making between 8000 and 9000 platings, were examined, and pathogenic dysentery bacilli were never isolated, except from men suffering from acute or chronic dysentery. This observation was confirmed by others from some 119,000 platings. The pathogenic dysentery bacilli

1. Banks, H. S. see *Lancet*, May 25, 1940, p. 966.
2. *Lancet*, Jan. 6, 1940, p. 1.
3. Brock, R. C. and Spurrell, W. R. *Guy's Hosp. Rep.* 1939, **89**, 262.
4. Boyd, J. S. K. *Trans. R. Soc. trop. Med. Hyg.* April, 1940, p. 553.

now recognised are divided into two groups according to whether they ferment mannitol. Of the non-mannitol-fermenters the most important is the *Bacterium dysenteriæ* Shiga, the only dysentery bacillus known to produce an exotoxin. *B. dysenteriæ* Schmitz (*B. ambiguus*) is distinguished from Shiga's bacillus by the fact that it produces indol from peptone and serologically a distinct antigen. Murray found it among a collection of strains obtained in the last war and since that time it has been found in asylum dysentery. The mannitol-fermenters are subdivided by their action on lactose and saccharose, for some ferment the sugars after a few days' incubation. The only known pathogenic member of the group of late lactose-saccharose fermenters is *B. dysenteriæ* Sonne, which is common throughout the world. The newly isolated organism has an antigen peculiar to itself, but it rapidly undergoes mutation. The mannitol-fermenting subgroup, which does not acidify lactose and saccharose, is known as the Flexner group, but this term is not sufficiently comprehensive. Recent experiences show that a much more extensive range of antigenic types exist, so that Andrewes and Inman divided them into five races, but the collection of strains upon which this division was based was not exhaustive; it contained, for instance, only one strain from India. Moreover, it was not recognised that strains maintained for some time in artificial culture have undergone variation. An analysis of organisms classified as Flexner bacilli isolated in military laboratories in the years 1926 to 1930 showed that more than a quarter of the Flexner-like organisms were of different antigenic composition from Andrewes's races. The proportion of inagglutinable races varied from 25·4 to 32·26 per cent. Several additional ones were identified, such as type 103, which when newly isolated is not agglutinated by serum from Andrewes's V-Z series, but after a time produces variants which breed true and form only colonies of their own type. Further, it is found that 103B, the variant, is almost identical with the Hiss and Russell Y strain. Subsequent observations have demonstrated similar variation in all the Flexner races, though not always so complete as in 103. During artificial life they show a constant tendency towards production of variants possessing decreased quantities of specific antigen and apparently increased quantities of group antigen.

Conclusions regarding the antigenic structure of the Flexner group have to be revised. Each does possess a distinctive specific or type antigen, but all share a common group antigen. Boyd's more detailed investigations have shown that the group antigen is more complex in structure than was originally supposed and contains several components. It is now proposed that membership of the Flexner group should include races which, in addition to possessing a distinct specific antigen, are also endowed with a common group antigen. Reviewed by these considerations the Flexner group is known at present to consist of six members, three of Andrewes's series and three others. Type 103 has a wide distribution, having been found in England, the Continent, the Near East, in West Africa and India. P.119 is another undoubted member. This race has not been found in England or in Europe but occurs in the Far East and has also been shown to be common in South Africa. Type 88 is of particular interest in England and differs from other members of the Flexner group in that its biochemical reactions are inconstant. In India it has been observed that about two-thirds of the strains are late fermenters of dulcite and that it is identical with the Newcastle dysentery bacillus and with the Manchester bacillus of Downie and Wade. This race has now been found in many parts of the world. As regards pathogenic action these three races, together with V, W and Z, should be classified as true dysentery bacilli. Besides these races others having the Flexner biochemical reactions but of distinct antigenic structure are occasionally found. Of these *B. alkalescens* is not associated with dysentery and is probably non-pathogenic.

Such, then, in outline, is the complex arrangement of the organisms causing bacillary dysentery. Their details are beyond the scope of the physician and may safely be left to the trained bacteriologist.

YEASTS ON THE BRAIN

INVASION of the meninges and central nervous system by a pathogenic yeast is a condition of which only 60 to 70 cases have been recorded, but observers of the disease believe that it may not be so uncommon, because of its simulation of other cerebral conditions. The usual subjective complaints of the illness, which may be protracted for months or be much more acute, are headache followed by giddiness, generalised weakness, pain in the neck, impaired or double vision and sometimes mental symptoms. The physical signs suggest cerebral abscess or tumour, or more often tuberculous meningitis, and the findings in the cerebrospinal fluid closely resemble those of the latter infection. The fluid, as described by Gray [1] in two recent cases, is clear with a small coagulum, the cells—never very numerous—are mostly monocytes, protein is increased, chlorides are strikingly low, sugar is diminished or absent, and the Lange colloidal gold curve is usually of meningitic type. The causative yeasts may be missed or mistaken for lymphocytes if the stained or unstained sediment is not examined with the oil-immersion lens. Culture, too, may be misleading, for growth on plain or blood agar is rarely visible in 24 hours, and even after 48 hours' incubation may be mistaken for *Staphylococcus albus*. Most of the recorded cases have been diagnosed post mortem from the presence either of a gelatinous meningitis usually accompanied by gelatinous cystic masses in the subjacent tissue or of embolic gelatinous cysts throughout the brain. The causal agent, variously known as *Torula histolytica*, *Cryptococcus hominis* or *meningitidis*, and *Saccharomyces tumefaciens*, is a true non-mycelial yeast which in cerebrospinal fluid and in affected tissues is characterised by the presence of a wide mucoid capsule, readily demonstrated in the cerebrospinal fluid by indian ink or other negative staining methods. It is believed that the usual portal of entry is the respiratory tract or paranasal sinuses, but a primary lesion in the skin has been described by several workers. Experimentally, the yeast is pathogenic for the mouse, either direct from the C.S.F. or from culture, and after intraperitoneal injection may invade the brain with the production of the typical gelatinous cysts.

INDIA AS A SOURCE OF DRUG SUPPLIES

IT is said on the good authority of Colonel Chopra [2] that three-quarters of the vegetable drugs in the British Pharmacopœia grow in India, some naturally and others by cultivation. Here, then, is a source of supply that can be drawn on if the output of mid-Europe becomes inaccessible to British importers. Not long ago, when the Japanese invasion of China suddenly deprived Europe and America of the raw material from which they manufactured ephedrine, the situation was saved by imports of ephedra herb from India. When all the ephedra needed could be

1. Gray, F. C. *S. Afr. med. J.* Feb. 24, 1940, p. 65.
2. Chopra, R. N. *Ind. med. Gaz.* April, 1940, p. 233.

obtained from China, the higher alkaloid content of the Chinese product made it unprofitable to collect, pack and export the Indian herb, which was therefore fed to the local pigs. When the law of supply and demand is working normally the rule of commerce is to buy in the cheapest market, but our main concern now must be to ensure ourselves an adequate supply of drugs, even at greater cost. Of the essential oils, India has the basic materials for the production of ajowan, caraway, chenopodium, cinnamon, coriander, cardamom, rose, sandal wood and turpentine, though of these only sandal-wood oil has so far been distilled in large quantities on scientific lines. Almost all the fixed oils used in medicine—almond, arachis, castor, hydnocarpus, linseed and sesame oils—are available in India, and arachis oil can suitably take the place of olive oil. Of the commoner alkaloids India can produce atropine and its salts, caffeine, emetine, ephedrine, morphine, codeine, quinine and strychnine, of which the last is already being largely manufactured. It needs only the stimulus given by the removal of foreign competition to make the manufacture of these drugs expand to almost any extent. Unfortunately cinchona plantations take 7 or 8 years to mature, so that it will be impossible for India to take the place of the Dutch East Indies if supplies from these should be cut off. Ipecacuanha is only grown in India in a small way, but in the Federated Malay States it grows extremely well. For most of the inorganic drugs and almost all the organic ones, as well as for the metallic compounds, India has herself been dependent on imports from Germany, Great Britain and elsewhere, so that we cannot look for help in this direction. An additional impetus has been given to the Indian drug industry by recent legislation, for the bill to reform the drug trade there [3] has now become law. The main difficulty standing in the way of her taking a leading place as a source of medicinal substances is her lack of the chemicals required in the manufacturing processes; of these sulphuric acid, the alkalis, the organic acids, and solvents other than alcohol are the most important. But in time she could make most of these for herself. As Colonel Chopra says, the need is for a central organisation which will establish drug manufacture in India on proper scientific and business lines.

CITRATED PLASMA IN SECONDARY SHOCK

REPORTS on the treatment of secondary shock with human plasma and serum are steadily increasing. One of the latest is by Strumia and his colleagues of Bryn Mawr, Pennsylvania,[4] who refer to the disadvantages in certain circumstances of blood-transfusion—the unavoidable delays owing to necessity of typing and cross-matching and so on. The quantities of fresh blood usually transfused during severe shock are probably quite inadequate to restore the normal blood-volume, and a further disadvantage of blood, fresh or stored, is that it may increase corpuscular concentration when this is already raised. It is now generally realised that the red cells of blood which has been stored in a refrigerator do not for long remain useful oxygen carriers. Hence the tendency to transfuse only the fluid part of the blood. Such is the enthusiasm in some quarters for plasma or serum (terms that some writers seem to think are interchangeable) that it is recommended for the treatment of simple hæmorrhage on the grounds that the maintenance of a normal volume of blood in circulation is of considerably greater moment than the oxygen-carrying power of the red cells. This assertion is true but only within limits, since a patient with severe anæmia may be in a very precarious condition.

Citrated human plasma is readily obtained from blood banks, and it can be stored at 4° C. for months, or with the addition of a preservative will keep well for some days even at room temperature. It is claimed that the pooled plasma from different blood-groups can be administered without preliminary typing or cross-matching and that with reasonable care in its preparation sterility tests may be omitted. One danger only has been stressed—that of heating the plasma—and Strumia gives it cold. There seems to be no objection to this course, and indeed Prof. A. M. Dikhno is reported to have given 400 transfusions at his surgical clinic at Khabarovsk using preserved blood at 4–8° C. without untoward effects. On some of the other claims, however, the evidence is scarcely strong enough for immediate acceptance and the conscientious surgeon would not care to omit, for example, testing the plasma against the recipient's corpuscles for agglutination. Citrated plasma and also serum can be reduced to the form of a dry powder and reconstituted fairly rapidly with distilled water. The advantages of the dry product in storage and transport are obvious and in addition it may be reconstituted for injection in hypertonic solution. Concentrated serum has been employed successfully in experimental shock [5] and may prove valuable in certain clinical conditions. Reports of the "toxicity" of reconstituted solutions and of serum in any form have already appeared but should be treated with reserve.

On page 1019 of this issue Mr. Ogilvie's third article on the surgery of infected wounds concludes a series of signed contributions to a subject of prime importance at the present time. It is proposed to collect and reprint these articles in a War Primer on Wound Infections. Suggestions as to how to enhance the immediate usefulness of this primer will be welcome. An early announcement will be made about the date of publication.

3. See *Lancet*, April 13, 1940, p. 702.
4. Strumia, M. M., Wagner, J. A. and Monaghan, J. F. *J. Amer. med. Assoc.* April 6, 1940, p. 1337.
5. Best, C. H. and Solandt, D. Y. *Brit. med. J.* May 18, 1940, p. 799.

Infectious Disease in England and Wales

DURING THE WEEK ENDED MAY 11, 1940

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 829; whooping-cough, 601; diphtheria, 657; enteric fever, 28; measles (excluding rubella), 6223; pneumonia (primary or influenzal), 795; puerperal pyrexia, 153; cerebrospinal fever, 315; poliomyelitis, 6; polio-encephalitis, 0; encephalitis lethargica, 8; dysentery, 33; ophthalmia neonatorum 105. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on May 10 was 827, made up of: scarlet fever, 139; diphtheria, 110; measles, 11; whooping-cough, 37; enteritis, 63; chicken-pox, 60; erysipelas, 30; mumps, 12; poliomyelitis, 1; dysentery, 7; cerebrospinal fever, 88; puerperal sepsis, 26; enteric fevers, 11; german measles, 60; other diseases (non-infectious), 61; not yet diagnosed, 111.

Deaths.—In 126 great towns, including London, there was no death from smallpox, whooping-cough or enteric fever, 1 (1) from scarlet fever, 2 (0) from measles, 28 (0) from diphtheria, 34 (11) from diarrhœa and enteritis under 2 years, and 25 (1) from influenza. The figures in parentheses are those for London itself.

Fatal cases of diphtheria were scattered over 19 great towns, Liverpool reporting 4. There were 8 deaths from diarrhœa in Birmingham.

PREVENTION AND TREATMENT OF WOUND INFECTION

VI

SURGERY OF INFECTED WOUNDS

By W. H. OGILVIE, M.Ch. Oxfd, F.R.C.S.
SURGEON TO GUY'S HOSPITAL

(Concluded)

PRACTICAL CONSIDERATIONS

In the series of which this is the last article various aspects of the problem of wound infection have been discussed, but the practical application of the scientific discoveries put before us can only be worked out in actual experience. Two important questions require amplification :

1. Can all injuries and wounds receive surgical treatment in time to prevent infection ?
2. To what extent are the lessons of the Spanish war applicable to the treatment of industrial accidents and of wounds in the present conflict ?

A lacerated and contaminated wound can be made clean if it is excised completely within six hours of infection. This, at any rate, was the experience in the casualty clearing stations of the B.E.F. during the quiet periods of 1917. Many soft-tissue wounds were sutured and healed by first intention ; penetrating wounds of the knee-joint uncomplicated by gross bone damage recovered with full movement ; gunshot fractures of the femur united in normal time without shortening ; abdominal wounds showed a survival-rate of over 50 per cent. ; and gas gangrene seemed a thing of the past. In March, 1918, the picture changed completely. Infection and gas gangrene were once more rampant, and the wounds recalled the dreadful months of the first winter of the war, with one difference ; then we were mystified, now we could sum up the cause in the single phrase "too late."

The irrecoverable opportunity was missed for three reasons : the wounded arrived too late, their condition on arrival was too grave to permit operation, or their numbers in relation to the surgical teams available were overwhelming. During fighting such as that of the German offensive all normal arrangements for evacuation break down. The wounded may lie about for days before being picked up. Roads are impassable, ambulances have been destroyed, and transport is further impeded by reinforcements and supplies being pushed forward. Then the C.C.S. serving any area may have been destroyed, or driven to some other place. The wounded must be dispatched in the direction in which roads or trains still allow their evacuation, so that they may first reach surgical attention at a base hospital some hundred miles away, and a week after they were wounded. In any batch so arriving, a considerable number are profoundly shocked, from cold, exposure, loss of blood or toxic absorption, and quite unfit to face operation. They are sent to a resuscitation ward, and an attempt is made by warmth, fluids and blood-transfusion to improve their condition, but by the time this has been achieved, infection has usually established itself in their wounds.

The most tragic aspect of surgery under these conditions is the total inability of the teams, working day and night with the deft skill of practised experts, to cope with more than a fraction of the numbers presented to them. Many surgeons will remember the hurried visits to the resuscitation and preparation wards in the interval between two cases ; the quick assessment of the rows of suffering but patient men by the light of a hurricane lamp or the first faint glow of dawn ; the rough division of the wounded into the three categories of "too late," "may be ready for operation in an hour or two," and "to be done as soon as possible." The return later, after eight or ten operations done at top speed, to the same wards, to find many of the more serious casualties already dead and their place taken by fresh wounded, and, worst of all, many of those who on the last visit were marked for urgent operation now transferred to the ranks of the "too late."

EXPEDITION

Those who direct the conduct of an army must concern themselves first with making it an efficient fighting machine, and in a battle the transport and supply of the combatant units has prior claim over anything. But in the army of any civilised country the care of the wounded has a claim only modified by the need to ensure victory. All that the medical services can do is to point out that the highest rate of recovery, and of restoration to useful function afterwards, will be attained only if the wounded reach an organised surgical unit within six hours of being hit. To what extent this recommendation can be implemented it is for the administrative services to decide. Transport from the front line to the advanced surgical unit can be arranged expeditiously in periods of stationary warfare, but it must be harassed at times of activity or in a war of movement. The advanced operating unit can be moved nearer the front line, and, as far as the surgical and nursing staff are concerned, they only ask to be placed where they are most useful. But a casualty clearing station requires a lot of equipment and a certain amount of stability : it must have level, rainproof and well-lit rooms for operating, it needs a big reserve of bulky stores, and it should be near a rail head or some big road or river to evacuate its wounded. Such a unit cannot usefully be placed any nearer the front line than the extreme range of the enemy's heavy artillery, except where there is special shelter as on the Asiago plateau in Italy. The first factor—delay in transport from battlefield to hospital—is thus dependent above all on military considerations that cannot be over-ridden.

In air warfare there is no front line. Under the purely hypothetical circumstances of a skilled and humane air force attacking a defenceless country it might be assumed that bombing would be limited to objectives of military importance. But an enemy approaching at heights over 20,000 ft. and chiefly concerned with unloading his bombs and escaping as quickly as possible from a well-organised defence is as likely to hit one point as another. The assumption that air-raid casualties will be incurred chiefly in the areas of dense population, and that the main surgical services must be placed outside this danger zone, is therefore probably unsound. Bombs may fall anywhere, not only maiming people but destroying buildings and roads, and in the hours of darkness they will inevitably disorganise the centrifugal traffic in any particular sector on which the evacuation of the wounded depends. Early débridement is as essential in bomb wounds as in shell wounds, and it should be done on the spot by surgical teams prepared to move from building to building and from one sector to another as the need arises. When day comes those patients who will stand the journey can be moved to the evacuation zone, and their wounds having already been cleaned the chief dangers of infection will have been averted.

In industrial accidents the need for early excision of wounds is already realised, and is being met by that decentralisation which is so marked a feature of contemporary surgical development.

RESUSCITATION

Some delay between reception and operation is inevitable with severely wounded men. Cold, fatigue, loss of blood and shock must be fought in this war as in the last, but our weapons are more efficient. We start where we left off with the simple devices of morphia, tilted stretchers, and stoves under the blankets, but we have in the continuous intravenous drip a method that facilitates all resuscitation measures, and greatly simplifies the conduct of a large recovery ward. With continuous infusion running

we can give any fluids from saline to blood in the quantities and at the rate we desire with a minimum of supervision, and can administer sedatives, cardiac stimulants, pressor drugs or sera by the same apparatus. The use of preserved body fluids is a further advance. Stored blood has been used for some time, and the methods of collection and transport now employed are eminently practical, and highly creditable to those who planned them. At ordinary times its short life implies a certain amount of waste, and it does not appear to be quite as effective as fresh blood in replacing that lost by hæmorrhage. In heavy fighting it may prove valuable, but under such conditions it has a serious rival in preserved plasma. Three pints of blood yield only one pint of plasma, but on the other hand it can be obtained from all blood-groups except AB, that is from about 95 per cent. of the population, and it can be sterilised by filtration and stored almost indefinitely without refrigeration. In some cases of shock, where there has been little or no hæmorrhage, the hæmoglobin percentage is raised and blood-transfusion is definitely harmful, and even where much blood has been lost an immediate increase in the amount of fluid is a more urgent need than the restoration of corpuscles. Plasma should provide a circulating fluid that is not lost to the tissues, that will in fact fill the place that gum saline might have done but for the risks inherent in the use of such a foreign substance.

THE SUPPLY OF SURGICAL TEAMS

In discussing the prevention of wound infection in war-time a question that must be faced is whether more operations can be performed in the grace period of six hours. A skilful and experienced surgeon can deal with from twelve to eighteen cases in this time, but cannot increase this rate appreciably except by substituting wide drainage only for thorough débridement, a policy that in the opinion of most would be disastrous. Where a selection must be made it has been found that patients with through and through wounds from rifle or machine-gun bullets can be evacuated for later operation with far less risk than those with bomb or shell wounds.

More surgeons can be called into service, indeed the number of potential teams is almost unlimited. War surgery demands certain qualities and immediate training rather than approved qualifications and the correct background. A good peace-time surgeon may be a nuisance at a C.C.S. and a clog in its efficient machinery, while the brilliant C.C.S. surgeon often becomes a menace in civil life. The main difference is that operating by the clock is in war an index of specialised efficiency, in planned surgery evidence of arrested mental development. The good C.C.S. surgeon must be young, strong, fearless, with clever hands and as much common sense and humility as the first quality will allow. He should have served a surgical apprenticeship, and he must know his anatomy; he should therefore have worked for, if not passed, the Primary, but he need not have the Fellowship. Every large hospital could lay its hands on fifty such men, who could be trained in the simple but exacting technique of débridement and warned of the dangers of suture. Cranial, thoracic and abdominal wounds should be diverted to the experts. War anæsthesia again is no specialism. Any surgeon who is familiar with the extraordinary high standard of the nurse-technicians in the hospitals of the United States, or who had a nurse anæsthetist attached to his team in the last war, could ask for no better service than these women can give.

The provision of surgical units to meet the needs of the fighting on any particular front raises the still larger question of whether, in a totalitarian war, the requirements on all the fronts of land, sea, air and home do not demand a unified medical service. The distribution of medical men is arranged, as far as possible, to meet the greatest demand that is expected, and since the need is fluctuating and unpredictable the provision must be on a lavish and wasteful scale. A doctor in the Services spends perhaps 10 per cent. of his time working really hard and the other 90 per cent. in almost unrelieved idleness, while his colleagues in civil life are overworking all the time. One service would facilitate that free interchange that seems everywhere desirable, and would allow the provision of a pool of trained surgeons who could apply those principles by which the worst horrors of wound infection can be prevented, whenever and wherever the need should arise.

EXPERIENCE IN THE SPANISH WAR

The splendid results obtained by the Catalonian surgeons with the closed plaster treatment of wounds, results that have been placed before British surgeons by Dr. Trueta in a manual that is admirably clear and convincing, inevitably raise the question whether the same methods should be adopted for the treatment of military and industrial wounds in this country. Trueta's book has much to teach even those who disagree with its main conclusions, and his achievement in obtaining 976 satisfactory results in 1073 projectile fractures with only 6 deaths is one of which any surgeon could justly be proud.

Trueta believes that this remarkable recovery-rate, the virtual disappearance of gas gangrene, and the extraordinary comfort of patients under treatment to which many visiting surgeons have testified is due to the combination of early and complete excision, free drainage, and immobilisation in plaster-of-paris, and in his writings he appears to lay the greatest stress upon the plaster-of-paris. Whether this particular method of fixation has in fact the virtues claimed for it is the only controversial matter in the teachings of the Spanish school, for the three principles are fundamental in the treatment of infected wounds.

Of these principles early excision is by far the most important, and the Spanish surgeons had opportunities in this respect more favourable than those obtaining on the Western Front even during its quiet periods, for their patients were wounded on their doorstep, and not suffering from exposure or privation at the time. It is unnecessary to look further than this opportunity for the reason for their immunity from gas gangrene. In assessing their results as a whole it is only fair to recall that the results in the B.E.F. twenty years earlier were also good under similar circumstances. Given early excision the worst dangers of infection are past, and the subsequent treatment should be chosen to give the best results under a particular set of conditions. To drain all excised wounds—and that is in effect the recommendation of the Spanish school, for they rarely encourage primary suture—is to play for the greatest safety by choosing second-intention healing and being content with second-best results. Primary suture implies greater anxiety than drainage. It should be undertaken only under the favourable circumstances that have already been discussed and by experienced surgeons who are prepared to reopen the wound at the first sign of failure, but on the other hand it should not be summarily dismissed to suit the needs of a comfortable routine.

The difference implied in the two policies may be illustrated by the example of a patient wounded in the knee-joint and brought to the operating theatre four hours later in good condition; his synovial cavity has been penetrated to the outer side of the patella by a piece of shell which has lodged superficially in the external condyle, taking with it a piece of clothing. In such a simple wound the whole track, including foreign matter and damaged tissue, can be excised completely. If excision is followed by suture of the synovial membrane and loose approximation of the skin the wound will probably heal in ten days, movements will be back to normal in six to eight weeks, and after the war the man can play cricket for his village or his county according to his talents. If the wound is packed and immobilised in plaster it will take from two to six months to heal, and normal movements of the knee will never be regained.

Many wounds cannot be closed safely even after early débridement, but must be drained and immobilised. Plaster-of-paris forms a rigid case exactly

adapted to an individual limb and the dressings round it; it provides perfect fixation of position but not of length. A plaster case ensures complete rest in injuries of the soft tissues; it gives true immobilisation in osteomyelitis because there is no solution of skeletal continuity, and in a reduced transverse fracture because continuity has been restored; but it does not immobilise an oblique or comminuted fracture of the femur or tibia, because it does not apply traction. The less dressings and padding are used the better will be the immobilisation, but also the more imperfect the drainage and the shorter the duration of the plaster. Under war conditions a plaster case can seldom be retained longer than ten days.

We may again compare the two methods by the example of a man with a gunshot fracture of the femoral shaft whose wound has been excised and packed at a C.C.S. If he is put in a plaster spica he will travel comfortably, and at the base will need the application of a fresh spica on the tenth day, and again two or three weeks later. His wound will heal progressively and his fracture will unite in fair rather than good position. If he is put in a Thomas splint he will travel as comfortably only if his attendants are expert. At the base, with his splint suspended from an overhead frame and weight extension applied, he will heal as rapidly as if he were in plaster provided the dressings are not changed unnecessarily, but his comfort will be greater, the length and alignment of his femur will be better, and his ultimate recovery of function and movement will be more complete and will come sooner.

The one advantage of plaster over any other method of fixation, and in certain circumstances it is an overwhelming one, is that it is fool-proof. Once a wounded man has undergone efficient surgical treatment and has been put in plaster he is safe—he may be blown out of an ambulance, derailed in a train, crashed in an aeroplane or torpedoed at sea, he may be left for weeks in a cellar with only food and water, but so long as his plaster holds he will come to no harm. This assurance is of such immense value to the medical services of an army that where the conditions of transport seem likely to be harassed the plaster method seems bound to find favour; with undisturbed communications it is unlikely to replace methods that have already proved their worth.

SPECIAL ARTICLES

GENERAL MEDICAL COUNCIL

PRESIDENTIAL ADDRESS

Mr. H. L. Eason, in his first presidential address to the council on Tuesday, said that they met in the midst of a struggle, the outcome of which may affect the future of the whole civilised world. Though the routine work of the Council had not been interrupted there was no guarantee that their session would continue undisturbed by aerial attack. Before delivering this address, the President went on, I have given thought to the question whether such addresses are necessary, and whether the infliction upon the council of a formal communication is justified. In order to make myself familiar with the history, traditions, and practice of the council, I have during the last few months read through the minutes of the council, and I have been convinced that the presidential addresses, which have been given uninterruptedly since 1866, afford to the members of the council, the public, and the future historian a concise survey of the actions of the council; they also give the president an opportunity of making on behalf of the council public announcements on important matters which may affect the medical profession either in this country or the Dominions. I am therefore emboldened to continue the practice of my predecessors.

The President referred with regret to the death of Sir Gilbert Barling, representative of the University of Birmingham on the council from 1917 to 1926, and a member of the executive and examination committees from 1919 to 1926. Mr. G. H. Edington, representative of the Royal Faculty of Physicians and Surgeons of Glasgow since 1928, had resigned, and the council would miss his engaging personality, his devotion to their work, and his shrewd common sense. In his place they welcomed Dr. Andrew Allison, professor of medical jurisprudence at St. Mungo's College, Glasgow, and a member of the committee of management of the Scottish Conjoint Board. Dr. Cecil Wall had resigned in December after representing the Society of Apothecaries of London since 1932. His quiet wisdom, keen interest in medical education, and love of tradition, were of great value in the council's more intimate discussions. His successor was Dr. J. P. Hedley, consulting obstetric physician to St. Thomas's Hospital.

During the last war, the President continued, the council were from time to time seriously concerned with the adequate supply of new practitioners and the problems of their education. In this war such anxieties do not at present arise, owing to the wise decision of the Government to place in the schedule of reserved occupations all medical students who have completed two terms' study in anatomy and physiology. This decision, together with the possibility of a student obtaining postponement of his calling up for a period of not more than twelve months in all, if he can satisfy the umpire on appeal from a hardship committee that he is about to proceed to a "critical" examination, will probably ensure the supply of a normal increment of practitioners even though the war should be of some years' duration. It is a matter of satisfaction to the council to learn that the licensing bodies generally have decided that, even during the war, there shall be no lowering of the standard of education required for entrance to the profession of medicine.

The council will remember that in the last war practitioners from certain provinces in Canada were desirous of coming to the aid of this country, but were hindered by the absence of reciprocal relations with the provinces as to registration. Steps were taken to overcome these difficulties, and as a result reciprocity was established with all the provinces of Canada except British Columbia. To our regret this reciprocity was terminated some years after the war by the provinces of New Brunswick, Ontario, Quebec, and Saskatchewan. Qualified practitioners are, however, now anxious to be placed without delay in a position to render professional services to this country. The executive committee have therefore empowered me to represent to the Lord President of the Council that appropriate action should be taken to facilitate the acceptance of these contributions to the common cause.

Prof. J. S. B. Stopford was elected chairman of business for the ensuing year.

DENTAL PENAL CASES

As a result of reports from the Dental Board the Registrar was ordered to remove the following name from the Dentists Register: Alexander Samuel Fraser Duthie. He was directed to restore to the Dentists Register the names of David Minton and Joseph Reay.

MEDICINE AND THE LAW

Cash Value of Lost Lives

In Mills *v.* Stanway Coaches Ltd. the Court of Appeal has tried once more to make a rough standardisation of the financial value of diminished expectation of human life. It seeks to discourage inflated awards. In assessing damage for loss of life, said Lord Justice Goddard, courts should think in hundreds, not in thousands.

Mrs. Mills, aged 34, was fatally injured in a motoring accident. Her husband sued as the administrator of her estate. The trial court gave him £2000. The Court of Appeal says this was excessive. It had itself awarded only £1000 for lost expectation of life in Rose v. Ford, where the dead woman was 23 years of age. The trial court gave twice as much in the case of Mrs. Mills, though she had already lived ten years longer. The appellate tribunal can hardly expect judges and juries to memorise a tariff of awards made in other cases. Nor will it interfere where the margin of difference is small. Lord Justice Slesser announced that the trial court in the Mills case would not have been overridden if it had only slightly exceeded the datum line of £1000—if, for instance, the award had been £1200 or £1300. But to double the figure prescribed in Rose v. Ford was "an entirely erroneous estimate of damage," which could not be allowed to stand. Not that £1000 is to be thought of as a fixed limit. Circumstances differ, and estimates in other cases are a guide and not a rigid figure. The sum of £1000, reached by the considered opinion of the lords justices in Rose v. Ford, is to be deemed a "reasonable guide" for the case of an adult woman. Age, it was said in a 1938 decision, is an element to be taken into account. When the victim is a child of 8, as in Trubyfield *v.* G.W.R. Co. (1937), forensic subtlety invites the court on the one hand to consider the bright prospects of health, wealth and happiness, and, on the other, to remember the possible chances of illness, accident, lunacy, a criminal career and a premature death. In the present period of anxiety and risk, indeed, counsel for the defendant might well insist that life is much less worth living to-day than a year ago. Yet it was held in Roach *v.* Yates that it was legally immaterial whether the patient did or did not wish to live or did or did not appreciate that his life was shortened. And there we must leave a problem which, as Mr. Justice Charles is in the habit of telling juries, is incapable of human solution. Courts cannot look into the future.

Another point in the Mills case was the additional award of £200 for the victim's pain and suffering. Mrs. Mills survived the accident by only four days; during most of the time she was unconscious. In these circumstances, says the Court of Appeal, she could have felt but little suffering. The damages on this head were therefore cut down to £50.

ADDENDUM TO THE B.P.

The British Pharmacopœia Commission is to publish an addendum to the B.P. 1932 as soon as difficulties in the printing trade permit. Its main purpose is to lay down a standard for an oleum vitaminatum which may be used in place of cod-liver oil, and with the exception of a monograph on tetanus toxoid all the new monographs are related to that purpose. The vitaminised oil is "a solution of vitamins A and D containing in 1 gramme 1000 units of vitamin A activity and 100 units of antirachitic activity (vitamin D)." As long as the finished product contains the vitamins in those proportions the choice of vehicle, within certain limits, is left to manufacturers of the new oil. Thus it may be prepared by dissolving a source of vitamin A and a source of vitamin D in a suitable vegetable oil "such as arachis oil" or may consist of "a suitable fish-liver oil, or blend of fish-liver oils." Manufacturing druggists seem to favour the vegetable-oil method, but in the United States, where a good deal of study has been given to the question of cod-liver oil substitutes, fish oils of high vitamin content are gradually supplanting vegetable oil, and are in fact sanctioned by a supplement to the U.S.P. which recently became effective. Thus pilchard and menhaden oils and frozen livers of various kinds of fish supplied to the manufacturers in hermetically sealed tins are being used for producing an oil which answers the requirements of the United States Pharmacopœia. Salmon oil, too, is being used for similar purposes and it may well be that when the war is over and cod-liver oil is normally available that commodity will have to compete with fish oils which, in respect of their vitamin content, are not inferior to the oil expressed from the livers of cod-fish. In view of the scope for ingenuity which the new addendum to the B.P. allows the prescriber may soon be confronted by an embarras de choix of vitaminised oils and it will not be surprising if some prefer products which have an association with the sea and retain something of the fishy flavour to which they are accustomed. The three monographs on concentrated vitamins are the servants of the main monograph, as also is the one on purified volatile oil of bitter almond, an ingredient of the new official formulas for cod-liver oil emulsion and vitaminised oil emulsion. A standard is included for "extract of malt with vitaminised oil" which is composed of extract of malt 90 per cent. and vitaminised oil 10 per cent. The opportunity has also been taken to include a monograph on halibut-liver oil.

Five monographs of the B.P. 1932 have been amended. In three cases—camphorated oil, hydrous ointment and compound mercury ointment—the object is to authorise the use of arachis oil, cottonseed oil or sesame oil instead of olive oil in preparing them. In the case of capsicum oil the formula permits the use of a base which does not require lard. The fifth amended monograph is on tannic-acid ointment for which a new formula is presented.

The Lancet 100 Years Ago

May 30, 1840, *p.* 338

From a leading article

Vaccination may be rendered compulsory without violating any constitutional principle; it would be absurd to maintain the contrary. But a measure founded on the compulsory principle is inexpedient, and it appears to us to be unnecessary.

The children of the wealthy and middle classes are invariably vaccinated. Few remain unprotected at the end of six months, so that small-pox is generated, and finds the majority of its victims, among the poor, and pauper classes. Now, let us, for a moment, visit a poor family in which the children are unvaccinated, and a death from small-pox has occurred. In the presence of the mother, we ask, what steps should have been taken, or is it desirable to take, to remedy the neglect? Fine or imprison her, say the advocates of compulsion. But why has she neglected her duty? Question her, and any or all of the following reasons may be alleged:—She believes that cutting for the cow-pox is a bad thing altogether; that it introduces "humours" into the child's blood; that it imparts a "beast's" disease, and that it is much better to let things take their natural course. Or she wished to have it done, and liked to have Doctor Andrews, who lived in the same street, but could not afford to pay him, and did not like to trouble him, though he offered to do it for nothing. Then the place where they inoculated children gratis was at a great distance, and they took the matter from all sorts of scabby little things; besides, she did not like the doctor there, who was a great fool, or very rough, and unfeeling.

PARLIAMENT

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

WHEN Parliament assembled on Wednesday of last week there was the usual order paper indicating the questions to be asked on that day and the course of business available at the vote office. There were also two other bills, one the "Treachery Bill" and the second the National Service (Armed Forces) Bill necessary to regularise the position of the Local Defence Volunteers, who were called for in a broadcast by Mr. Eden, the new War Minister.

These two bills were drastic enough. That Parliament should find it necessary to pass a bill imposing the death penalty for treachery and another to regularise the position of the Defence Volunteers raised to repel invasion by the new parachute arm meant clearly that war had come on to the Home Front in all its grimness. But I had heard a hint that there might be something more and asked the vote office for "the other bill which is being presented." But of this they professed to have no knowledge and no mention of it appeared on the order paper. Nevertheless, as soon as questions—fewer than usual—were answered Mr. Attlee rose and in his new rôle of Deputy Leader of the House proposed the Emergency Powers (Defence) Bill which places the whole resources of the nation, men, women, land, factories and wealth of every kind, at the disposal of the Government. As Mr. Attlee was speaking individual members of the House went out of the chamber to the vote office in the lobby and brought back sheaves of the one-page document, which places the whole resources of the nation, men, all along the packed benches. In this way the House learned of the gravity of the occasion and beginning at 3.25 P.M. had passed the bill through all its stages by 5.23. The bill was also passed by the House of Lords.

The people of Great Britain, through their representatives in Parliament, here placed all power to mobilise the resources of the nation to fight the war to victory in the hands of the Government. Our constitution, our liberties, our wealth are at the Government's disposal, for everything must be thrown into the balance to resist the enemy and to overcome him. This makes of Parliament not a less but a much more important body than it was before, for in it now resides the only constitutional power to undo what it has done and restore what it has temporarily taken away. The gravest responsibility now rests on Parliament to safeguard the exercise of powers by the executive and safeguard the rights and liberties of British citizens.

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Next day the Speaker read a letter from Sir John Anderson, the Home Secretary, announcing the arrest of a Member of Parliament under the Defence (General) Regulation of 1939 and his removal to Brixton prison. By 7.30 P.M. the Limitation of Dividends Bill and a number of other matters had been disposed of, including powers to raise money for supply in 1941 and 250 million pounds additional on a procedure carried out last year in respect of 1940. The resolution was moved by Sir Kingsley Wood, the new Chancellor of the Exchequer, and Mr. Pethick-Lawrence in commenting on the figures involved said the resolution is "of course one of tremendous significance and involves sums which are astronomical in their size and which, in the course of their issue and expenditure, will involve exceedingly large and grave problems." What is notable about these financial proposals is that they are put forward in specific form and not by proceeding through regulations under the wide powers conferred on the Government by the Emergency Act just passed.

A land-drainage resolution was moved after this and the money resolution under the Colonial Development and Welfare Bill for the remission of debts of nearly 10 million pounds and to provide other moneys.

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It does not appear that Parliament will surrender its right and duty of scrutinising financial proposals big or little. The fact that there is not much discussion in the House does not mean that details are not in fact considered. But a great deal of work goes on now by committees of members and the committee plan of work may extend and increase.

What will at once affect the nation more immediately and intimately is when proposals are made for large-scale plans for maintaining standards of nutrition and fitness in the nation. Essential food-supplies should, in the opinion of many members, be made national services, and the new evacuation plans will no doubt have their own health problems.

FROM THE PRESS GALLERY

Colonial Development

IN the House of Commons on May 21 Mr. MALCOLM MACDONALD moved the second reading of the Colonial Development and Welfare Bill. He said that it was characteristic that whilst every ounce of our energy was thrown into the task of discomfiting, defeating and destroying the enemy the House of Commons nevertheless found time to offer substantial, and indeed generous, encouragement to colonial development. Let the world mark the passage of this measure as a sign of our faith in ultimate victory. In the last generation there had been a great deal of wise government of the colonies and advance had been continuous. There was, for example, the steady reinforcement of the Colonial Medical Service which had resulted in an increasingly effective attack on tropical and other diseases. But in this and other aspects of development many colonies suffered from the handicap of insufficient revenue. A majority of the colonies could not afford to finance a number of vital services, including medical and veterinary research, the building of clinics, hospitals and schools and the steady increase of health measures of all kinds. This bill proposed fresh departures from the points reached by the existing Colonial Development Act. First, the moneys to be made available for colonial development were to be multiplied more than five-fold. Instead of a fund restricted to £1,000,000 a year this bill would authorise expenditure on colonial research up to £500,000 a year, and expenditure on colonial development and welfare up to £5,000,000 a year. The provision for research was for an indefinite number of years and that in regard to development and welfare was assured for the next ten years. The sums stated were maximum figures so far as the present legislation was concerned. Secondly, by this bill they were widening the whole field of works and activity which could be assisted. Thirdly, they were removing another cramping provision which limited the contribution of money out of the Colonial Development Fund to the capital cost of works. This would remove the anomaly that, while money could be provided to meet the cost of the erection of a research station or hospital, none could be given towards the running costs of such schemes.

Major Sir JOCELYN LUCAS in welcoming the bill, said that though we had our duties to the natives it was the white settlers and administrators who had

invariably been responsible for such improvements and progress as had been made, more particularly in the conquest of tropical diseases. In this and in other respects he hoped that we would coöperate with our French allies.

Dr. HADEN GUEST said the plan presented in the bill for setting aside money for colonial development was admirable in itself, but in what way was the money to be spent? There was no comparison between what had to be done in the West Indies, an old country with a social system which never worked well and had to a large extent broken down, and what had to be done in, say, West Africa, where there was an active and vigorous native population. He had not heard Mr. MacDonald set out any plans for spending this money.

Sir FRANCIS FREMANTLE urged that native education should be directed towards the objects which appealed to these people—namely, agriculture and health. When he was a sanitary officer in Mesopotamia during the last war there were sanitary squads composed of various races which had come from India or Arabia, and he had been astonished by the powers of observation, deduction and action shown by even the more primitive people after they had been through a course of malaria prevention. Another example was the British Empire Leprosy Relief Association which had been established for about 15 years and had branches all over the Empire. The result of this scheme had been that knowledge had been obtained of the extent of leprosy throughout the world. It had been found that leprosy was two or three times as prevalent as had been supposed. Formerly the treatment was entirely insufficient. The leper was a pariah cut off from civilisation. Modern methods had shown that probably two-thirds of these cases were no longer infectious and could be returned to ordinary life. Clinics had been established and people now came forward in the early stages with splendid results. In Zululand they were struggling along with small hospitals containing about 20 beds and having financial resources of £400 a year. He hoped that grants would be made under this bill to assist small hospitals of this kind in different parts of our colonies. Zulu girls were now being trained as midwives. One little hospital was sending out something like a dozen midwives a year. A special effort should be made under this bill to provide facilities for training native people for work in health services. One of the first essentials was to train midwives whose work resulted in a tremendous saving of life, but it was necessary also to train other workers. Doctors would have to be trained when they got to the stage of establishing voluntary medical schools, but what was necessary now was the training of people for subordinate services as auxiliaries, to help as dressers, laboratory attendants, sanitary inspectors, and so forth. Research work was also important. A great deal more could be done in psychology in relation to the natives.

Mr. MACDONALD in reply said that the Government were now awaiting the submission of plans from the local governments drawn up with their local knowledge. The Advisory Committee on Development and Welfare would then begin to function. The scheme was fairly elastic. The statement he now made about the expenditure of the money provided under the bill was strictly confined to the war years. Very likely war conditions would not permit the Government to reach the maxima of £5,000,000 and £500,000 a year while the war lasted, but he certainly thought they would reach figures approximating to those in the years after the war.

"... All our drivers agree that the Red Cross only attracts the attention of German pilots. In the past 10 days Nazi airmen have been bombing or machine-gunning our ambulances, sometimes only from 50 feet. The Red Cross no longer protects our men, and we are removing it in their interests."—The committee directing the American volunteer ambulance on the French front, quoted in the *Times*, May 27, 1940.

QUESTION TIME

R.A.M.C. Officers and Private Practice

Dr. EDITH SUMMERSKILL asked the Secretary of State for War whether he was satisfied that it was in the best interests of the Army that officers of the R.A.M.C. should be permitted to attend, for fees, private patients outside the service; and on what grounds he differentiated these cases from those of members of other callings or trades wishing to supplement their Army pay.—Mr. A. EDEN replied: Officers of the R.A.M.C. are not permitted to set up in private practice in competition with civilian medical practitioners, but they are free to act in a consultative capacity or do other similar work of a casual nature which does not interfere with the performance of their military duties, and I think this is a beneficial arrangement.—Dr. SUMMERSKILL: Have you considered the difficulties created for commanding officers of units by this practice? A commanding officer was frequently asked by a man for extra leave in order to see private patients, and consequently the commanding officer had to get other men to do the work of the unit.—Mr. EDEN: This rule has been in operation since 1924, and I am told it works very well. On the face of it, it seems to be a reasonable requirement.

Sir FRANCIS FREMANTLE asked if the Minister realised that the difficulties of supplying the needs of the civilian population were very great, and that it was only right that the doctors, whether serving in the Army or civilians, should be used whenever required.—No further reply was given.

Tuberculosis in England and Wales

Mr. S. P. VIANT asked the Minister of Health whether he could supply an estimate of the number of deaths reported in England and Wales in the year 1938 as due to bovine tuberculosis.—Mr. MACDONALD replied: Of the deaths registered in England and Wales in 1938, 26,176 were classified as being due to tuberculosis. Of these, 4246 were classified as being due to non-respiratory tuberculosis; these deaths would include the majority of the bovine cases; in the absence of special investigation, it is not possible to give more definite information.

Dr. EDITH SUMMERSKILL: In view of the gravity of the answer given, can the Minister say whether he proposes to take any action to prevent the sale of tubercle-infected milk?—Mr. MACDONALD: This is an indication of the great importance of getting ahead with schemes of pasteurisation.—Dr. SUMMERSKILL: Can the Minister say whether he proposes to take any action soon in regard to that?—Mr. MACDONALD: I shall take any action which is practicable in present circumstances.

Mr. W. GALLACHER asked the Minister what was the number of beds reserved for tuberculosis and available for immediate occupation on March 31 in England and Wales, respectively; and the number of such beds expressed as the number per 100 annual tuberculosis deaths for England and Wales, respectively.—Mr. MACDONALD: The latest date for which complete returns are available is Dec. 31, 1939. On that date, the number of beds reserved for the treatment of tuberculosis in England was 24,606 of which 19,312 were occupied. The corresponding figures for Wales were 1827 and 1640. The annual death-rate returns for 1939 are not yet available, but the number of beds reserved for the treatment of tuberculosis in England expressed as the number per 100 tuberculosis deaths in 1938 is approximately 102, while for Wales it is 91.

Mr. GALLACHER: What was the number of patients on April 30 on the waiting-list for admission into institutions and sanatoria of the Welsh National Memorial Association; the time the longest case had been on the waiting-list; and the average period of waiting?—Mr. MACDONALD: The number of patients on April 30 on the waiting-list for admission into institutions and sanatoria of the association was 333. Twenty-two weeks is the longest time a case has been on the waiting-list and the average period of waiting is ten weeks.

Soldier's Death after Inoculation

Mr. W. LEACH asked the Secretary of State for War what inoculation caused the death of Private Alfred Carlisle, aged 33, of the Leicestershire Regiment, on whom an inquest was held at the Grand Hotel, South Wigston, on May 6.—

Mr. EDEN replied: Private Carlisle received his second inoculation against enteric fever on April 19. He was taken ill and died the same day. Post-mortem examination revealed that he was suffering from a variety of medical conditions, more particularly disease of the main blood-vessels of the heart. The cause of death was "acute dilation of the heart," to which the inoculation was a contributory factor. It was found at the inquest that Private Carlisle's unsatisfactory state of health could not be determined by external medical examination, and, as he made no complaint, would not be suspected.

Recruits and Mental Instability

Mr. RHYS DAVIES asked the Minister of Labour and National Service whether he had now made arrangements with the medical boards to avoid passing into His Majesty's forces persons who were physically fit but of unsound mind.—Mr. ASSHETON, parliamentary secretary to the Ministry of Labour, replied: The instructions issued to medical boards provide for inquiry to be made into a man's personal and family history of nervous and mental illness and for a specialist's opinion to be obtained in cases of doubt. The attention of medical boards has recently been drawn to the importance of their examination of this condition, and the possibility of taking further steps with a view to the identification of mentally unfit men is also being explored. The matter will no doubt receive consideration by the committee [1] under the chairmanship of Lord Horder which has been appointed to advise on medical questions arising in connexion with the examination of men by medical boards.—Mr. DAVIES: Are you aware that mental welfare associations operating under local authorities will have almost complete lists of these young men, and is it possible for the medical boards to work in coöperation with these associations?—Mr. ASSHETON: I hope very much that that can be done.

Biological Science and Camouflage

Sir JOHN GRAHAM KERR asked the Home Secretary if he was aware that the establishment of the scientific principles which determined the effectiveness of camouflage was the work of biological specialists in this subject; that one of the leading authorities in this specialised branch of science was a British subject; and if steps had been or would be taken to ensure that his full-time services should be available to the country during the present emergency.—Sir JOHN ANDERSON replied: I am aware that biological science has made an important contribution to the study of camouflage, and I have invited a British biologist to serve on the Camouflage Committee. He has accepted my invitation and will, I have no doubt, be ready to give to the matter as much of his time as may be required.

No Badge for Physical Rejects

Mr. LESLIE BOYCE asked the Secretary of State for War whether he would consider the issue of a badge to men of military age who had been rejected as unfit for service.—Mr. EDEN replied: I do not think there is any need to issue a badge to denote inability to join His Majesty's forces on account of physical unfitness or any other reason.

Evacuation of Adult Invalids

Mr. MARTIN asked the Minister of Health whether he would prepare a scheme for the evacuation of adult invalids such as those who were bedridden and therefore not able to make private arrangements for their own evacuation.—Mr. MACDONALD replied: I am afraid that it is not practicable to include within the Government's evacuation scheme arrangements for the removal of adult invalids such as those who are bedridden.

Mr. R. C. MORRISON: In view of the fact that most voluntary societies which have many of these cases brought to their notice are unable to do anything about them and to get them away, could not you do something to assist the local bodies carrying on this work? Mr. MACDONALD: If we can do anything to assist these bodies we shall be glad to do so, but the whole position must be governed by the prospect of accommodation in the reception areas.

Compensation for Air-raid Injuries

Mr. RHYS DAVIES asked the Minister of Pensions the procedure to be employed by civilians claiming state compensation in respect of injuries caused by air-raids.—Sir W. WOMERSLEY replied: Claims in respect of injuries caused by air-raids should, in the first instance, be made to the local office of the assistance board, who act for this purpose as agents for my department. The address of the board's local office may be obtained at the nearest post office.

1. See *Lancet*, May 23, 1940, p. 990.

IN ENGLAND NOW

A running commentary from our Peripatetic Correspondents

LIFE in our academic world nowadays has about it a feeling of unreality. Those lucky people who have been commandeered by the Government for special duties have, we suspect thankfully, unloaded their peace-time responsibilities on younger and more restless shoulders and have vanished behind the scenes. This is not what we under-forties envisaged at all. We took care that the Government were informed of our unique scientific value, and awaited with confidence the call to forge or unforge secret weapons. But alas! In the twinkling of an eye the captains and the kings had departed, and the forlorn remainder had been impressed with their indispensability in the cause of medical education. The facts were too obvious for dispute: any further depletion of staff and the students would have to teach themselves. Thus did the grim future unfold itself to our incredulous gaze. No thrills, no excitement, no novelty; just evacuation problems, unsuspected deluges of administrative detail, teaching and examining. The same mixture as before, ad nauseam. This is not to suggest that in normal times it is unpalatable, quite the reverse, but as the surgeon practises surgery and the physician medicine, so does the physiologist practise physiology and the anatomist anatomy. Dilution of the mixture with research increases its efficacy. I have yet to meet the physiologist who feels that in teaching alone he is doing his duty to himself or to his students. Of prospects of research we could see none, and I am told by my laboratory assistant that on the outbreak of war I lost, by slaughter, 4000 mice.

The event has proved less grievous than the anticipation, thanks to our delightful hosts who have accepted us without question and given to us every possible practical help. In fact we sometimes feel that they regard us as a welcome diversion. The University of London provides a never-failing source of wonder and entertainment. Our erstwhile chieftains occasionally emerge from the fog of war to exhibit wisdom and enhanced vitality, and to prevent our administrative inexperience from proving disastrous. One experience, more than any other, led me to accept my lot with the best possible grace. That was a month with the E.M.S. at the beginning of the war. We know, thankfully, how Hitler failed us then, and I cannot deny that the return to familiar duties was welcome, if not so exhilarating as the 200-mile dash to the hospital which I importantly made on that first fateful Sunday. Disillusion went deeper than boredom. Had casualties come on the expected scale, hard work might have disguised the fact that blood transfusion is technically simple and not a career in itself. But as it happened I had no answer to the reproof of my conscience that I had contemplated deserting a skilled occupation for one at which I was unskilled. In ten apparently short years I had become out of date, and of much less use clinically than my newly qualified colleagues. I found an age in which starvation was unknown as a treatment for hæmatemesis, and intravenous saline a panacea.

So we resign ourselves to the sheltered life, and at lunch-time usurp the functions of the Supreme War

Council. No doubt we are to be envied, and nothing surprises me more than the importance attributed to our task by others. We are not all, however, yet fully exploited. As the new routine becomes established, we are beginning to have time for research. The problems on which we are engaged may be important, and we may apply to them the energy engendered by the war. But they are not all problems of war-time significance, though they may represent the civilisation for which the war is being fought. Those responsible for seeing that war-time investigations are carried out must be aware of this; individually, our qualifications are card-indexed, and we wait in hope. At the word of command we are prepared to leave the custody of civilisation temporarily in the hands of our friends across the Atlantic and use our training for more immediate ways of preserving it.

Meanwhile, knowing that the authorities would be the last to pretend omniscience or the monopoly of ideas, I am sufficiently impressed by a circular to members of the Society for Experimental Biology to quote from it (without permission, which I hope doesn't matter). It says: "There is reason to believe that many biologists would welcome an opportunity of putting forward suggestions for types of research work which might be undertaken at the present time." Stating that the society have made arrangements to receive such suggestions, it goes on: "Specific plans which could be carried out by the individual suggesting them with his existing laboratory facilities are to be preferred, but suggestions of a more general nature might be worth while. . . . If research workers feel that their special knowledge and experience can be used it is up to them to explain the manner in which this can be done. . . ." Organisation of this kind is an excellent idea, and might be adopted by other bodies. It provides opportunity for those who would be neither sluggards nor busybodies.

We must not forget the students. They have been magnificent. Evacuation has interfered with the courses of both visiting and resident students, but they have accepted the situation and have settled down to learn by individual effort that which can no longer be spoonfed to them. They are anxious to "get on with the job" and we shall hear more of pleas for intensification of the medical course. Meanwhile, they have kept their heads as good medical students should, and have neither rushed away in a body to join the army, nor indulged in pacifist demonstrations. Our advanced honours physiology and anatomy courses have had to be discontinued, causing severe disappointment to a few. These courses must still exist elsewhere in the country, and I wonder if they have been thought of as a possible source of medically unqualified attachés to the medical staff of the Air Force. I pretend no first-hand knowledge as to whether there is any room for such individuals, or whether they could do anything which cannot equally well be done without them, but the problems of aviation seem to be highly scientific and physiological, and it appears at first sight probable that assistants skilled in physiological technique might relieve the medical officers of some examinations and other routine procedures. I mention this, because I have heard the argument raised that students at this time should not linger, but become qualified as quickly as they can. The shoe may be on the other foot. One would like to be assured that there are no duties which a man with special physiological training might not do as well as a medical officer, while postponing his own clinical training until after the war.

* * *

There's a lot of talk about not having time to finish the game and beat the Spaniards too, but Harrow plays the M.C.C., and my friend has no wish to talk of such other events of the day as the German occupation of Abbeville. He is upholding his tradition, in the firm belief that it will be justified by another Waterloo.

Another hoary tradition of the summer season broke surface in these columns last week: the annual visit of the medical critic, in his professional capacity, to the Royal Academy. His assertion that the young female person of today has no more subcutaneous fat than the male would, I think, meet with dissent from most clinicians; it is not lack of exercise that is responsible for the peculiarities of female anatomy, surely, but just that masculine instinct that continues to paint females with adequate fat in the right places. Those popular science columnists who make heigho while the sun-that-never-sets still shines might well debate whether in the course of evolution the secondary female sex characters are determined by a male standard of beauty based on more mundane considerations or vice versa. This chicken-or-egg controversy will, I suppose, never be solved until we can visualise man as a pattern changing in the woof, as he thinks, dialectically, the weft constituted by "successive anastomoses of navel cords."

Turning from matters of fact, our critic's attitude is revealed by a sentence far more appropriate to this running commentary. "The settings of the nude," he says, "have changed from those of religion and mythology to scenes of everyday life, and thereby have *lost* all reality." (My italics.) Does it matter whether "young women really take off their pyjamas on arising from their couch before they comb their hair?" Reality concerns photographers not artists, and least of all those inhibited souls whose lovely women had to pretend to be Greek goddesses. To quote a *Lancet* annotation (1936, **2**, 1108)—a definition to end definitions—"Art production is a dialectic process in which the perceptual elements on the one hand and the subliminal stresses on the other are unified in a new and satisfying synthesis." While no-one would seriously suggest that this applies to the average academy picture, I feel that it is a pity to berate the subliminal stresses that occasionally occur. Particularly so now, when the threshold level is going up. Skirts rose in the last war to unprecedented heights: this time we may expect an even greater economy in textiles. Already that harbinger of fashion, the Stage, has come up with a bang—up against those guardians of their fellows' morals whose personal problems make them so vociferous about what is perhaps the least important of war evils. Indeed, the relaxations of standard of sexual morality which is usual during war might be regarded as the human counterpart to Nature's supposed device of increasing the male births.

* * *

For centuries the theatre has had the fun of presenting complex states of the human mind; but most playwrights have fought shy of the psychological problems which may or may not afflict the dead. Ghosts, spirits, witches and others of that kidney are expected to behave according to the rules and to have simple, honest motives like remorse or revenge or mere spite. It was refreshing to meet the other day a neurotic ghost on the boards, whose motives, judging by his own account of them, were anything but simple. The play was "The Mad Organist" by Terence Greenidge, and it was performed at London's smallest theatre, the Bankside Little Theatre at Ealing, which is managed by the Misses Siddons-Downe. The ghost was the mad organist in person, though he was only mad nor'-nor'-west. He had returned, so he said, to persuade someone to burn his wicked manuscript—a perfectly respectable motive for any ghost—but I suspect he had really come back to talk about his symptoms. There is precedent for this, of course, for Hamlet's father enlarged on the pathology of his own demise with the scrupulous detail of an outpatient chronic, but the mad organist' from the medical, or anyhow the psychiatric, point of view, was the more interesting case of the two.

The play is largely an account of his personal conflict, and he was lucky to drop on a woman novelist of an analytical turn of mind; suppose he had chosen to haunt a busy medical practitioner during surgery hour? But he had his chance to talk and he came

clean. His conflict, of course, had begun while he was alive, and it was the old conflict of good and evil; but the impressive thing about the play was the insight with which his dissociated state was described. He had come to a country village as a dreamy young man whose deep pleasure in the honest simplicity of his own life, and of the life around him, had seemed at first unshakable; and then he had experienced that inversion of mood which leads the mentally sick person to say "Everything seems changed." In his case the Tennysonian idyll in which he had been living suddenly lost its meaning and he turned for refuge to the morbid contemplation and pursuit of evil; or perhaps he only thought he did, it would be the same thing as far as he was concerned. Anyhow he wrote a book about it, and fell in love with an appropriately villainous young woman and generally did his best to make a job of it. But the interesting part was that all the time he was carrying on his ordinary life as a pleasant village music teacher as though nothing had happened. As he put it himself, "there was sweetness and there was light, and *no one ever suspected what I was really up to.*" Another phrase had the same authentic ring about it; the view from his window had become like "a painted backcloth, one not too convincingly painted either." So what with one thing and another—his guilt about his book, his inability to decide conclusively whether good was the thing to back or evil, and the failure of his friends to spot the trouble and look after him—he made an end of himself; though even that wasn't conclusive, as he had found out to his cost. The play finishes on the same indecisive note, for he left his distorted view of life as a legacy to the woman novelist. But is it distorted? She leaves us guessing, by remarking disturbingly: "Great is the truth and it shall prevail." It looks as though there is still an unresolved conflict somewhere.

* * *

Imperturbability, as Osler pointed out, is among the most valuable of human qualities. On one of those sunny mornings when the war news was pretty grim I came across my patient Mr. Rock, the proprietor of "The Duke of Wellington." Perhaps I should not call him patient, for I have never known him ill, though he is kind enough to call me his doctor. He has seen some 20 years' service in the Royal Navy and is built rather on the lines of a medium-sized tank. When I met him he was reclining at ease on the village green, basking lizard-like in the sun, his hat pulled over one eye, his hands clasped across his great belly. "You don't seem to be worrying much," I said. "Why should I be?" he replied. "Don't you regard the situation as serious?" I asked. He shrugged his shoulders, then slowly and deprecatingly waved a ham-like hand. "Give 'em time," he said. "Only give 'em time." I reflected that Mr. Rock and his like would take a deal of Nazifying.

LETTERS TO THE EDITOR

READING MATTER FOR THE FORCES

SIR,—May I remind your readers of the needs of the Forces for books and other reading matter? The Service Libraries and Books Fund, under the lead of the Lord Mayor of London and the Lord Provost of Edinburgh, was called into being at the Mansion House at the request of Whitehall to collect books for the Forces and money for the purchase of books. Great strides have been made in this work, and the number of books collected and sent to the Navy, Army and Air Force is already approaching 1½ millions, but this is barely sufficient to keep pace with the demand from the men and women on active service.

The Postmaster-General has just announced that books and periodicals may be handed in at nearly all post offices, unaddressed and unwrapped, for transmission free of charge to the central book depôt. This makes the giving of books very simple, and any that readers can hand in will be greatly appreciated. Periodicals and illustrated papers, such as those discarded from professional waiting-rooms, are particularly valued, and a regular contribution of this kind, say once a month, even more so. The organisation also needs to be constantly purchasing some types of book to make up the particular balance of fiction and non-fiction required by the Forces. May I ask all those who will send a gift for this purpose to make donations payable to the Lord Mayor of London at the Mansion House, London, E.C.4, marking the envelope "Books"?

I am, Sir, yours faithfully,

HERBERT CREEDY,
Deputy-chairman, Service Libraries and Books Fund.

BLOOD-TRANSFUSION SERVICES

SIR,—Is it not time that some serious consideration was given to the subject of the organisation and coördination of emergency blood-transfusion services throughout the country?

Long before the outbreak of hostilities individuals both lay and medical in various parts of the country had foreseen the need for blood-transfusion services which would arise in case this country were subjected to heavy bombing from the air. Some weeks before the declaration of war widespread attention was semi-officially drawn to the subject through the B.B.C. and in other ways. At the same time numbers of persons connected with existing blood-transfusion services and in most instances attached to voluntary hospitals received intimations through local representatives of the Ministry of Health that they should do something in the matter—just what was not indicated. For the London area a comprehensive emergency blood-transfusion service was at once organised and has since been functioning in a highly efficient manner. Its organisation was carried out and it is now maintained by a personnel subsidised from the public funds. In no other part of the country has such assistance for emergency blood-transfusion services been made available. The Minister of Health on July 20 stated in the House of Commons in reply to a question by Mr. Geoffrey Mander that outside the London area recognition would only be given to certain large centres and that this would apply only to "the testing and registering" of donors. Only an almost imperceptible minimum of assistance even in this direction has so far been forthcoming.

The organisation of a blood-transfusion service demands more than the mere testing and registration of donors. It demands the services of personnel to collect the donors when required and to withdraw the blood; further, it calls for the provision of suitable receptacles and storage places for the blood so withdrawn and the means for its distribution as required. The advantages of standardisation in all these measures is obvious; no attempt at such standardisation on a national scale exists.

It is difficult to understand why the Ministry of Health while recognising the claims of the London area to a full service should withhold it from the rest of the country. Is it too much to hope that, in view of the imminent danger now threatening, the Ministry may be induced to take some steps towards the coördination and standardisation of existing blood-

transfusion services, and further, to extend to the provinces assistance comparable to that given in the London area?

I am, Sir, yours faithfully,

S. C. DYKE,

Director, Wolverhampton and District Emergency Blood-Transfusion Service.

SUPPLY AND DEMAND

SIR,—I am in full agreement with the leading article in your issue of May 25. Many of us signed a memorandum sent by the B.M.A. almost a year before the outbreak of war. In this we told the powers that be the capacity in which we were willing to serve—but we have heard nothing further. To my mind it is imperative that all doctors under the age of 40 should be conscripted forthwith. No doubt exemption would have to be granted to a number of these in order to provide for the medical needs of the civilian population; others such as surgical specialists would be drafted to casualty clearing stations. Since research is undoubtedly a luxury in war-time, all research workers under 40 years should be conscripted at once.

Many of us who saw active service in the last war and are over 50 would willingly offer our part-time services to attend to the medical needs of troops in the localities in which we live. We know the routine and this work would only involve the expenditure of two or three hours a day. By this means younger men now engaged in such work could be at once freed for service overseas.

The organisation of the profession has been undoubtedly dilatory but drastic action should at once be taken.

I am, Sir, yours faithfully,

Wimpole Street, W.1. W. ANNANDALE TROUP.

REFUGEE DOCTORS

SIR,—If the Government proceeds with its proposal to conscript doctors of military age many younger doctors will have to leave their posts and there may be some dislocation of the medical services of the country. I believe that this could be minimised by employing the services of doctors who are at the moment idle. I refer to those refugee doctors from various countries, a great number of whom, like myself, would be prepared to help in the British Army. I am Czech and I realise that in the Czech Army which is fighting with the Allies there will be a large surplus of doctors whose services could be used to the greatest advantage as medical officers in the British Army.

I am, Sir, yours faithfully,

A CZECH DOCTOR.

POSTERIOR-PITUITARY EXTRACT

SIR,—I was interested to read in THE LANCET of May 18 Dr. McLellan's account of the response of the non-gravid human uterus to posterior-pituitary extract. I would like to offer my personal experience of the action of this substance.

For about four years I received daily injections of posterior-pituitary extracts for diabetes insipidus—at first Pituitrin and later Pitressin. I can well remember the severe attacks of uterine "colic" which invariably followed a dose on the day immediately preceding a menstrual period. Pain was of such severity that it was necessary to suspend the injections at such times. However, as soon as menstruation was established this colicky pain did not occur. The preparations used throughout were Parke Davis products and doses of 10 units twice daily were generally given. I was a medical student at the time. The condition was ultimately treated by deep X-ray therapy to the pituitary gland.

I am, Sir, yours faithfully,

London, S.W.11. ELURED WILLIAMS.

OZONE TREATMENT OF WOUNDS

SIR,—In 1916 Major George Stoker, R.A.M.C., working at the Queen Alexandra Military Hospital, Millbank, obtained successful results in healing obstinate war wounds by the use of a Quain silica ozoniser. He tabulated his experience in THE LANCET (1917, **1**, 797). "The results," he wrote, "cannot be regarded as anything but satisfactory from every standpoint, be it humanitarian, scientific or economic. It is reasonable to allow one week of treatment by ozone for every month of previous duration without healing by other methods before healing can be expected." These cases consisted of chronic septic cavities and sinuses in the femur, tibia and other long bones, open wounds with sloughing surfaces, tuberculous infection of abdominal wounds, septic leg and arm amputations, trench feet, penetrating wounds in the knee-joint, suppurating glands in the neck, and penetrating wounds in the chest with empyema, abscess in the lung and so on. In May, 1917, a memorandum was issued by the D.D.M.S. London District to military hospitals offering to provide apparatus for ozone treatment, with the result that 36 war hospitals applied the apparatus. From nearly all of these reports were issued confirming Major Stoker's earlier work. Several hundred cases were successfully dealt with, in a large proportion of which other methods had failed.

In April, 1919, Captain J. R. Patterson and Captain A. W. MacBeth of the Canadian Army Medical Corps, working at the Canadian General Hospital, Orpington, reported on 16 cases of much the same type among several hundred cases treated with ozone at that hospital during the previous two years. All these yielded to treatment, and bacteriological records showed the rapid germicidal action of ozone.

The method of treatment is simple. The wound is washed with sterile water and dried with a sterile swab. The dresser then moves on to the next case and a convalescent patient wheels the ozoniser alongside the bed, connecting it with the electric current. He takes a sterile glass nozzle from the dressing carriage, adjusts it to the end of a flexible catheter which conveys the ozone from the machine, and sprays the wound area evenly with the gas. In the case of sinuses the nozzle is inserted into the wound. The length of treatment varies from two to fifteen minutes, depending on the nature and size of the wound. With two machines wounds can be ozonised almost as rapidly as one dresser can prepare them. When all the wounds have been prepared the dresser starts at the beginning again and applies a dry sterile dressing to those that have been ozonised. The edges of the wounds may be touched with liquid paraffin to prevent the dressing from sticking when it is removed.

The motive for using dry dressings is twofold. First, no antiseptic solutions are used because most of these are incompatible with ozone. Secondly, it is more comfortable to the patient; a wet dressing is soon saturated and keeps the wound soggy and favourable to bacterial growth. Dakin's solution is not incompatible with ozone, but since cases in which it was used showed no improvement over controls treated with ozone alone it was discarded as unnecessary.

Ozone seems to increase the blood-supply to the part. We have demonstrated this experimentally.

The web of a frog's foot was fastened under a microscope and the circulation in the capillaries noted. Ozone was then applied to the part and after a minute there was an obvious acceleration of capillary flow followed by a slowing. To decide that this was not due to the current of air playing on the part, we tried the experiment with an air current alone; after several minutes no change was noticed, but on the resumption of the ozonised air the change was quite noticeable.

Ozone fills a long felt want as a local stimulant to indolent tissues. By increasing the local blood-supply, especially where cicatrices are starving the area, chronic infection is overcome and the cells are sufficiently nourished to promote healthy healing. It is especially useful in cases which do not yield to ordinary methods.

Major Stoker also drew attention to the effect of the inhalation of pure ozone in cases of gassing. He wrote (THE LANCET, 1918, **1**, 550): "Ozone produced by silica tubes and properly administered is absolutely non-irritating, and seldom fails to give relief or cure, being a powerful agent in the formation of oxyhæmoglobin, increasing it when inhaled by 3½ per cent. It is a complete germicide, and renders sputum and wound discharges microscopically aseptic. . . . It is a strong heart stimulant." In gassed cases he established that ozone (1) relieved the cough, dyspnœa and pain; (2) assisted the expulsion of the glutinous mucus from the air-passages; and (3) stimulated the heart's action.

I am, Sir, yours faithfully,

J. R. QUAIN.

Chemical Club, Whitehall Court, S.W.1.

MEDICAL NEWS

University of Cambridge

Dr. J. S. Mitchell has been elected to the Elmore medical research studentship.

On May 25 the following degrees were conferred:—

M.D.—O. A. Trowell and W. T. Cooke.

M.B., B.Chir.—R. H. Taylor.

Society of Apothecaries of London

Dr. Margaret Venters and Dr. Sidney Hill Waddy have satisfied the examiners for the mastery of midwifery.

British Pharmaceutical Conference

This conference will be held in London at the house of the Pharmaceutical Society, 17, Bloomsbury Square, W.C.1, instead of at Bath as had been planned. It will be confined to two days, June 11 and 12.

South African Institute for Medical Research

Dr. E. H. Cluver, secretary for public health and chief health officer for the Union of South Africa, has been appointed director of the institute in succession to the late Sir Spencer Lister. He will take up his new duties on July 1 when Dr. J. H. Harvey Pirie, the acting director, retires. Dr. George Buchanan, superintendent of the routine division of the institute, has been appointed deputy director.

Colonial Medical Service

The Secretary of State for the Colonies has appointed Sir Wilson Jameson as his medical adviser, in succession to the late Dr. A. J. R. O'Brien. The appointment is a part-time one and Sir Wilson Jameson will continue his duties as dean of the London School of Hygiene and Tropical Medicine.

Cooperation in Scottish Hospitals

Mr. Thomas Johnston, M.P., regional commissioner for civil defence in Scotland, presided over a meeting held in Edinburgh under the auspices of the Nuffield Provincial Hospitals Trust with the object of promoting the coördination of health services in Scotland. Lord Nuffield's gift will form the nucleus of a central fund for financing a scheme of regionalisation and for making grants to regional boards in aid of hospitals. There has admittedly been a shortage of accommodation for the general sick in Scotland and in the past the work done by voluntary and local-authority hospitals in their respective spheres has been hampered in many areas by the absence of general coöperation. Real progress in the development of the country's hospital services must depend upon coöperative regional schemes. Such regionalisation now in prospect under the trust will open a new era in hospital administration. The various schemes for achieving this are to be examined in detail by representatives of the Scottish branch of the British Hospitals Association and all local authorities, while the Department of Health for Scotland is to keep in touch with their deliberations.

V.D. Centres for Seamen

The list of treatment centres in the chief sea and river ports throughout the world where seamen can obtain treatment for venereal diseases has been revised and copies of the new list may be obtained from the Stationery Office (price 6*d*.).

Royal Sanitary Institute

The sessional meeting of this institute that was to have been held at Hastings on June 15 has been indefinitely postponed.

Society for the Relief of Widows and Orphans of Medical Men

The annual general meeting of the society was held on May 15 with Mr. V. Warren Low, the president, in the chair. On Dec. 31 there were 62 widows and 4 orphans in receipt of grants. During 1939 grants of £3225 from the ordinary funds and £1493 15*s*. from the Brickwell fund were given. The total membership of the society was 289. During the year 6 members were elected, 3 died and 1 resigned. The number of widows in receipt of grants this year was such that no funds were available for the customary Christmas present to be given. Particulars of the society may be had from the secretary, 11, Chandos Street, London, W.1.

Mobility of Civil Nursing Reserve

All trained nurses, assistant nurses, and nursing auxiliaries in the Reserve who have been allocated as "mobile" members for whole-time hospital work outside London, but are not yet so employed are now to be regarded as available for service, if need arises, in any casualty hospital in England and Wales. Until now, mobile members, although they have volunteered for service wherever required, have been allocated to a particular hospital in the first instance. In future they will be called up as required by the regional nursing officers of the Ministry of Health. In general they will be required to serve only in the civil defence region where they are registered, but it may be necessary to draw upon a regional "pool" of nursing personnel to meet the urgent needs of another region.

". . . The unconscious always has the great fundamental disadvantage of not being capable of scientific proof; in accordance with its definition it cannot consequently be brought out into the daylight of consciousness, and cannot be investigated by means of empirical observation, but only indirectly inferred. It has therefore become the great waste-paper basket into which everything is put that cannot be placed elsewhere, and through this conception modern psychology has suffered a confusion which has opened the floodgates to the most impossible interpretations. For a scientific investigation of the psychological the unconscious is really nothing but a way out of a dilemma."—Prof. J. A. LOESER, Animal Behaviour, London, p. 173.

OBITUARY

HERBERT JOHN PATERSON

C.B.E., M.CHIR., M.D. CAMB., F.R.C.S.

Herbert Paterson, who died in Glasgow on May 21 at the age of seventy-three, was a pioneer of medical postgraduate teaching in London. He was one of the original founders of the Fellowship of Medicine in 1919; until 1931 he was its honorary secretary, and from 1931 until his death he was the chairman of the executive committee. He was also a member of the committee responsible for establishing the British Postgraduate Medical School, and after its formation he was appointed a member of its governing body.

Elliot & Fry.

Paterson was born in Argyllshire, the son of the late Dr. H. S. Paterson, and was a foundation exhibitioner at Trinity College, Cambridge. He went on to St. Bartholomew's Hospital in 1890 with a senior entrance scholarship in natural sciences. He qualified in 1892 and the following year took his M.B. Four years later he obtained his F.R.C.S. He held house-appointments at Bart's and demonstrated anatomy in Cambridge before he was appointed assistant surgeon to the National Temperance Hospital in 1901. In 1904 he was awarded the Jacksonian prize of the Royal College of Surgeons of England for a dissertation on the diagnosis and treatment of such affections of the stomach as are amenable to direct surgical interference. Two years later he delivered a Hunterian lecture at the college, and in 1910 he obtained the degree of M.Chir. In later years his books on gastric surgery, indigestion, surgery of the stomach, and jejunal and gastrojejunal ulcer following gastrojejunostomy showed his continued interest and ever-growing experience in this specialty. He examined in surgery for the universities of Cambridge and Glasgow.

Meanwhile he was becoming more and more absorbed in the National Temperance Hospital where he became surgeon in 1913. When he retired in April 1934 he was appointed emeritus surgeon in recognition of his outstanding work. When he first joined the staff there was no outpatient department and he was partly instrumental in creating it in 1907. It was he, too, who introduced the lecture now given each year at the hospital to commemorate the work of Sir John MacAlister. For many years he held an annual gathering of his patients from all over the British Isles. Many of them were, of course, gastric cases, and the function was known as "Herbert Paterson's Gastric Tea."

During the last war physical unfitness prevented Paterson from serving in France, and he threw himself into many voluntary activities at home. He was honorary surgeon to Sister Agnes Keyser's Hospital in Grosvenor Crescent, but he was anxious to do more and conceived the idea of opening his own hospital for officers. He found a suitable house in Highgate, and the late Lord Melchett financed the venture, to which Queen Alexandra gave her name and sympathetic interest. The War Office soon realised that he was not only a fine surgeon but an excellent administrator whose judgment they could trust, and his hospital was recognised as one of the best in the country and some of the severest cases from the front were sent there. Paterson was among the first in this country to recognise the value of gas and oxygen as an anæsthetic and he was using the method at his hospital long before it was vaunted as something new by the Americans in their ambulance at the Lycée Pasteur in Paris in 1915.

When the American College of Surgeons was founded Paterson was one of three representatives of British surgery who attended the opening ceremony. He was for some time medical honorary secretary of the British Nurses Association, and he did much to see that the nursing staff in the hospitals had good food, pleasant quarters and reasonable off-duty time. He was also a member of the Council of Dr. Barnado's Homes.

A colleague writes: Herbert Paterson was a kindly little man with an old-world charm not often found in Harley Street today. One of his greatest hobbies was conjuring and he had a boyish enthusiasm for magic. He was quite an adept himself, and he enlivened the concert of many a sea voyage by his sleight-of-hand tricks. The annual dances of the Fellowship of Medicine often included a conjurer in their cabaret, as a tribute to Mr. Paterson. He was himself a staunch abstainer and never prescribed alcohol for any of his patients. He was a remarkably good speaker and had an amazing memory.

He married Tempé, daughter of the late G. H. Faber, M.P. for Boston, Lincs.

ISAAC FLACK

L.R.C.P.E., D.P.H.

Dr. Isaac Flack, mayor of Radcliffe, died at Bangor, co. Down, on May 22. Born in Galway in 1882, the son of Samuel Flack, he studied medicine there, at Belfast and at Edinburgh where he qualified in 1907. After three years spent in practice at Norwich he came to Radcliffe in 1910 as assistant to the late Dr. Scarr with whom he afterwards went into partnership. During the last war he served with the R.A.M.C., and for a time was specialist sanitary officer at Cherbourg. Soon after his return to civilian practice he began to take an interest in local public affairs. He helped to found the Radcliffe socialist party, he served on the council, and later became one of Radcliffe's first aldermen. His interest in education made his work as chairman of the education committee especially congenial and he proved himself a first-class committee man. He was elected mayor in 1938 and during the last eighteen months his professional and municipal duties had been heavy.

He married May, daughter of John Harris, who survives him with a daughter and three sons, one of whom, Dr. Harvey Flack, is now serving with the R.A.M.C.

". . . In a letter received a short time ago from a friend I read the following statement. . . . Any medical man who strays outside his speciality is apt to be regarded askance. If you are a bacteriologist and you make your lifework the thirty-two types of pneumococci you will be honoured by all your colleagues, but try to limit the spread of pneumococcal infection by clearing the slums and you will be called an advertiser, or an adventurer, or perhaps, the final insult, a Communist!"—W. R. F. COLLIS, *Irish J. med. Sci.* May 1940, p. 199.

WITH THE B.E.F.

MEDICUS, M.P., IN FRANCE

DURING the days immediately before the beginning of the German offensive of May 10 I visited the medical arrangements made for divisions, corps, lines of communication and base. The question I felt inclined to ask then was, "has there been too much mechanisation?" Lorries to transport officers and men, lorries to transport whole field ambulances, lorries to transport casualty clearing stations, hospitals, mobile motorised bath units, disinfestation units, blood-refrigeration units, and mobile bacteriological and hygiene laboratories. But with all this mechanisation a high standard of physical fitness. One division with which I spent a day had discarded motor transport for the troops for a period and had marched the men from one point to another partly as a test of fitness and partly in order to make certain that the marching could be done without detriment to divisional organisation if circumstances made it necessary. The march was one of 72 miles in three days and the number of men who fell out and had to be carried on motor vehicles was astonishingly low. The standard of fitness is high and is no doubt partly to be explained by the general rise in fitness standards since 1918 and partly by the general regime and especially the excellent food-supply. It was hardly considered the duty of a regimental or other unit M.O. in 1914–18 to concern himself with the diet of battalions or batteries or other units in the field. There was the diet-scale laid down, a good one, and all that was required was to adhere to it. In this war the diet of troops in the field is better than before and it is very much the business of the M.O. and of the administrative medical officers of a division to see that the diet standard is maintained. The caloric value of the diet would satisfy even the most exigent food-reformer.

The war of movement which has developed has answered my question about mechanisation. It was not too much but it was enough even to the extent of having organised the transport of blood for the refrigerator units by air instead of by road. This mobility was also expressed in another way in adaptability to circumstances. An advanced C.C.S. I visited was established in a fine building where, if circumstances permitted, it could expand almost at will to take on the function of a general hospital, but from which, if stability was not required, it could move as a complete C.C.S. in a very short time from the receipt of the order.

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The field ambulance of today has retained all the flexibility of organisation which it had in the last war and added to it because of its mechanisation. Anything from an M.D.S. to an A.D.S. or a camp for convalescent treatment is within the ambit of the F.A. and it has added new treatments. For example, gonorrhœa is treated and cured at field ambulances by the new chemotherapeutic treatment in a very short time. Skin infections have not been serious, no doubt because of high physical standards and good diet, but also partly because of the regular bathing facilities which mobile bath units make possible. Even under the conditions of the very mobile war which has developed it should be possible to maintain these bath services.

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Another aspect of the fitness question is the high degree of protection against tetanus which exists in front-line divisions. The percentage of men protected by tetanus toxoid is very high, as is also that of those protected by T.A.B. But enteric or dysenteric troubles, if not completely absent, have been almost negligible, no doubt because their prevention was not neglected by the hygiene laboratories. Other infections have also been few.

When visiting one division I found that the A.D.M.S. would be away all day consulting with his opposite number of the adjoining French division. And this consultation is a usual thing and not an occasional event and is not confined to divisional or smaller units. There are meetings of French and British consultants at G.H.Q. and views are exchanged. Further, in some cases civilian consultants of distinction are called in to counsel by the armies. The procès-verbale of the meetings between French and British consultants at G.H.Q. is issued and is a source of important information. French and British armies are part of the one big fighting machine and the medical side of the French service, while not organised on exactly the same lines as our own, functions in the same way. And the French medical institutes have been put at our disposal—particularly those of civilian France—in a way which is of great assistance. The contrast between the intimate coöperation of French and British medical services now and the less intimate coöperation there was in the last war is a concrete sign of the unity of purpose which unites us.

Births, Marriages and Deaths

BIRTHS

BEVAN.—On May 26, at Oxford, the wife of Lieutenant Roger Bevan, R.A.M.C.—a son.

DOWNIE.—On May 22, at Cambridge, the wife of Dr. A. W. Downie—a son.

GRACE.—On May 7, at London, Ontario, the wife of Prof. Archibald J. Grace, F.R.C.S.—a daughter.

LEHMANN.—On May 21, the wife of Dr. G. D. Lehmann, of Dehra Dun, U.P., India—a son.

PICTON.—On May 26, in King's College Hospital, the wife of Lieutenant A. D. Picton, R.A.M.C.—a daughter.

REEVES.—On May 9, in Alexandria, the wife of Captain G. W. D. Reeves, R.A.M.C.—a son.

SCOTT.—On May 20, the wife of Dr. Rupert Scott, Hook, Hants—a son (who lived only a short time).

MARRIAGES

GREENWOOD-PENNY—ARCHER.—On May 23, at Nether Stowey, Somerset, Sydney Augustus Greenwood-Penny, M.R.C.S., R.A.M.C., of Marazion, Cornwall, to Joan Margaret Archer.

TAYLOR—HANN.—On May 25, at Miskin Church, A. Brian Taylor, M.D., to Marjorie Hann.

WADDY—LAWRENCE.—On May 8, in Accra, Bernard Broughton Waddy, B.M., Captain, Gold Coast Regiment, to Mary Elizabeth Lawrence.

WADE—HACKING.—On May 13, at Blackburn, Henry John Wade, M.D., Surgeon Lieutenant, R.N.V.R., to Margaret Smith Hacking.

DEATHS

FLACK.—On May 22, in Bangor Hospital, Isaac Flack, L.R.C.P.E., D.P.H., of Radcliffe.

SEQUEIRA.—On May 21, at Westcliff-on-Sea, Henry James Sequeira, M.R.C.S.

YOUNG.—On May 25, at Esher, Surrey, Matthew Young, D.Sc. Edin., M.D. Glasg.

Appointments

CRUICKSHANK, L. G., L.R.C.P.E., D.P.H., resident surgical officer at the Chesterfield and North Derbyshire Royal Hospital.

HARVIE, ADAM, M.B. N.Z., F.R.C.S.E., D.T.M., resident surgeon at the Kingston County Hospital, Kingston-on-Thames.

KEANE, C. A., M.R.C.S., D.P.H., medical superintendent at the Mental Hospital, Berrywood, Northampton.

LEWIS, MAURICE, M.R.C.S., temporary assistant medical officer in the A.R.P. casualty services of Portsmouth.

YOUNG, J. A., M.B. Edin., bacteriologist to the Agricultural Research Council.

Examining Surgeons under the Factories Act, 1937: Dr. G. M. JONES (Ystalyfera, Glam.); Dr. A. W. HENDERSON (Keith, Banff).

NOTES, COMMENTS AND ABSTRACTS

SURGERY OF THE COLON

IN opening a discussion on cancer of the colon at a meeting of the section of surgery of the Royal Academy of Medicine in Ireland on Feb. 16, Mr. Seton Pringle first called attention to the importance of the presence or absence of obstruction and the site of the growth in deciding the best operative technique to be employed. In cases in which, before the onset of gross obstruction, considerable inflammatory induration of the bowel has taken place for some distance above the growth efficient drainage of the proximal bowel is, he said, essential, but he does not advise the performance of a blind cæcostomy except in most extreme cases. He does not approve of a cæcostomy for obstruction in the lower pelvic colon. Mr. Pringle then described a modification of the Paul-Mikulicz operation which he has found useful. He advocates suturing the parietal peritoneum alone to the "double-barrelled" colon as it emerges from the abdominal wall and also the use of vaseline gauze wrapped round the bowel outside the peritoneum to prevent adhesion between the emerging bowel and the abdominal wall. As a result of this procedure, about a week after operation the two openings into the bowel can be seen at the bottom of a conical granulating wound deep to all layers of the abdominal wall but still extraperitoneal. Restoration of the continuity of the bowel. is thus greatly facilitated. He also described a method of anastomosis for certain cases of lower pelvic colon growths in patients who would otherwise be condemned to the discomfort of a permanent colotomy. After mobilising and excising the growth both ends of the bowel are closed by purse-string sutures and the lower (rectal) stump is buried by a second layer. The purse-string suture controlling the upper segment is left long, and a bull-dog clip attached to the end. The rectum is then plugged with gauze soaked in flavine. A second incision is made through the anterior wall of the rectum, the gauze is picked up in a bull-dog clip, and the assistant withdraws the gauze through the anus, bringing down with it the suture and the attached upper segment of the bowel, thus invaginating the closed end of the pelvic colon into the rectum. A few sutures secure the bowel in that position. A week or so later the ligature comes away and the lumen of the bowel is restored. The preliminary colostomy can be closed later. He claimed that this method allows anastomosis to be carried out deep in the pelvis without risk of sepsis, the mucous membrane of neither colon nor rectum being handled even with a forceps and there being no fæcal flow over the line of anastomosis until healing is well advanced. In this way certain growths in the lower pelvic colon can be dealt with without sacrificing the sphincters.

NATIVES IN BRITISH NORTH BORNEO

THE two ancient races of British North Borneo (roughly speaking, farmers and hunters) are represented respectively by the Dusuns and the Muruts. Vital statistics are admittedly incomplete and inaccurate, but there seems to be no doubt that, while the Dusuns show a fairly steady excess of births over deaths, the Muruts are dwindling and in danger of dying out. An investigation was undertaken by Dr. J. O. Shircore in 1936, to discover factors responsible for depopulation and to suggest measures for combating them.[1] In our columns[2] Dr. A. J. Copeland had already drawn attention to the dangerous position of the Muruts, amongst whom, he said "malaria is highly endemic," while "the high true spleen-rates are associated with serious infection even among the youngest infants." Dr. Shircore's study too shows that malaria is one of the two greatest factors in racial decline, being hyperendemic throughout the interior.

The second serious factor is gonorrhœa, which is undoubtedly responsible for the high percentage of complete and one-child sterility which prevails. Hookworm and endemic goitre are also widespread. Malnutrition is also rife and it is strange to read that "although there are thousands of cows, buffaloes and goats, none of the milk or its products are utilised by the native." The removal of people from districts of intense infection to healthier areas, increased facilities for medical examination and treatment, and a vast extension of education, particularly in relation to hygiene, dietetics and agriculture are reforms which are both urgent and obvious.

Both Dr. Shircore and Dr. Copeland were impressed by the inadequacy of medical provision for the people of British North Borneo, and urge the necessity for a substantial increase of staff and supplies, especially of quinine and vaccines, if the native races are to be given a reasonable chance of survival and health.

1. Report on Native Health with special reference to the sociological and economic factors bearing on the depopulation problem of the interior of West Coast, North Borneo. Government Printing Office, Sandakan.
2. *Lancet*, 1935, **1**, 1233.

RUSSIA'S MILLIONS

THE "Russia Today" Press Service gives some interesting details of the population of the U.S.S.R. at the census of 1939. Since the last enumeration, made in 1926, there has been a total increase of 23·4 million or about 2 million persons per annum. The age composition has, however, changed remarkably little. In 1926, according to Pearl[1] 37·2 per cent. were in the pre-reproductive period of life, ages 0–14, 49·9 per cent. in the reproductive period, ages 15–49, and 13·1 per cent. in the post-reproductive period, 50 or over. In 1939 the corresponding percentages were 36·2, 50·8 and 13·0. High birth- and death-rates continue to prevail in spite of the increase in culture reported—in 1897 only 24 per cent. of the population aged 9 and over were classified as literate, in 1926 it was 51 per cent. and in 1939 it had risen to 81 per cent. The U.S.S.R., it may be noted, has a total population rather more than four times that of England and Wales but she has seven times as many children and only twice as many people over the age of 60. Minority problems are fashionable: the Soviet has no dearth of them. The census lists forty-nine nationalities with over 20,000 representatives apiece. Of these Germany comes twelfth with nearly a million and a half.

BILIRUBIN IN URINE

IN a letter to *Nature* for May 18 Dr. Frank Marsh points out that there is no very satisfactory chemical test for bilirubin in urine. He has now found a single manœuvre by which the van den Bergh or Fouchet tests can be applied to urine. One part of finely powdered dried normal egg albumin is added to nine parts of the urine and this is well shaken until the powder has all been taken up. The van den Bergh and Fouchet tests can then be carried out on the urine in the same way as they are on blood-serum and with results comparable in sensitivity.

BLEACH OINTMENT

THE British Standards Institution have issued a specification in the A.R.P. series for the anti-gas ointment known as bleach ointment, made by mixing stabilised bleaching powder with white mineral jelly. The specification defines not only the properties of the ointment itself but also those of the bleaching powder and the mineral jelly from which it is made. Copies of the specification may be had from the institution at 28, Victoria Street, S.W.1, price 4*d.* post free.

1. *J. Amer. stat. Ass.* 1940, **35**, 277.

LESS SUGAR FOR MEDICINES

AFTER July 1 supplies of sugar for medicines will be reduced by 10 per cent. A new order made by the Ministry of Food revokes the previous arrangement under which the Sugar Controller's allotment for 1940 was 100 per cent. of the amount used in 1939, as estimated from returns made by manufacturers and wholesale druggists, hospitals and retail pharmacists. As a consequence of this revision wholesale houses will have to ration supplies of medicines containing sugar to their customers, but if sugar is mainly reserved for children's medicines, as was suggested by the Therapeutic Requirements Subcommittee of the Medical Research Council (*Lancet*, April 6, 1940, p. 660), the reduced allocation should be more than sufficient to satisfy the needs of manufacturers and dispensers. Sugar allocations to other purposes have also been reduced, and after June 1 glucose (including liquid glucose, dextrose and dextrose monohydrate) will also be rationed.

"FURBIE"

AMONG the latest recruits to the ranks of medical autobiographers is Dr. Edward P. Furber, a Bart's man, who qualified in the 'eighties and practised first in Surrey and later in the West End. "London Doctor" (Bles. 10*s*. 6*d*.) reveals him as a cheerful and debonair person, perhaps less conspicuous for intellectual depth than for a lively interest in, and sympathy for, people of all kinds. In Surrey he found time for club cricket and for hunting—with four packs to choose from. His account of these good times at the end of the last century will cause some to sigh wistfully. He has met a variety of notable and notorious characters about most of whom he has something interesting to say. Among his theatrical friends and patients he numbered Miss Gladys Cooper and Miss Tallulah Bankhead, who explained to Mrs. Furber that she only called him "darling" when she was nervous. He was also on intimate terms with Alan Parsons and the Tree family and relates the charming "mot" of Lady Tree who, when asked within a day or two of her death why she had had her solicitor to see her, replied: "Oh, he has only been teaching me my death duties."

SYNTHETIC BRISTLES

TOOTHBRUSHES will shortly be on the market fitted with nylon fibres in place of bristles. The nylons are a range of new materials derived from coal which have hitherto been produced in America, but Imperial Chemical Industries have three factories in course of erection for their manufacture in this country. Nylon fibres can be made of any thickness from those fine enough to be spun into yarn for making stockings to stout rods. In toothbrushes it is claimed that the synthetic bristles wear better than hog's bristles and do not break off or split, that they absorb only a fifth as much water and therefore keep their stiffness when wet, and that they are resistant to the action of toothpastes and bacteria.

ALCHEMY

IT has always been difficult for the plain man to understand the tortuous phraseology and tortuous mental processes of the students of alchemy, and "Alchemy Rediscovered and Restored" by A. Cockren (Rider. 6*s*.) is not likely to render his task easier. If, as the author holds, there is a real science hidden in the researches and writings of the older alchemists, his first object should have been to make it clear why these men gave so much time and thought to the transmutation of metals, and of these metals only a selected few. It cannot be said that he has offered any rational explanation of the enthusiasm with which so many men of high attainments and devoted studies pursued the search for the Philosopher's Stone. Nor is his demonstration of the "practical" results either clear or convincing. It is incorrect to claim either a rediscovery or a restoration of alchemy until its devotees are prepared to state exactly what they are seeking and what are their methods. Till this is done, and it is certainly not done in this book, alchemy will continue to rank in the judgment of sober men with astrology as one of the nobler delusions of the mystic, and one of the favourite fields of the charlatan.

A DOCTOR IN THE SUDAN

HAVING spent the greater part of his professional life there, Dr. Allan Worsley has acquired a great knowledge of, and love for, the Sudan and its people. By the untravelled it is too readily assumed that the Sudanese and Egyptians are virtually indistinguishable. The stories and sketches incorporated under the title of "Land of the Blue Veil" (Cornish Bros. 10*s*. 6*d*.) abound in atmosphere and proclaim the charm of the Sudan and its inhabitants. Herein will be found something to please a variety of tastes and moods, from the macabre to the lightly humorous. Of the character sketches "Sabur" is perhaps the most attractive. Very moving is the story of "The Dervish Rosary" and no less fascinating in quite a different way are the folk-lore tales, especially "Black and White."

NEW PREPARATIONS

SYNTHOVO (HEXŒSTROL).—The results of clinical investigations with hexœstrol were described in a report to the Therapeutic Trials Committee of the Medical Research Council published in our columns (*Lancet*, April 6, 1940, p. 629). It is now presented by Messrs. Boots as Synthovo in tablets, each containing ½ mg. or 5 mg. of the substance, and in ampoules containing 1 mg. or 5 mg.

BROMETHOL—BOOTS is a solution of tribromethylalcohol in amylene hydrate manufactured under licence in the laboratories of Messrs. Boots. Each c.cm. contains 1 g. of tribromethylalcohol and 0·5 g. of the solvent. It is supplied in stoppered bottles, containing 25 c.cm. and 100 c.cm. of the solution, for use as a basal anæsthetic.

HEXANASTAB is the brand name of soluble hexobarbitone manufactured by Messrs. Boots. It is the sodium salt of N-methyl-C : C-cyclohexenylmethylbarbituric acid for use as an intravenous anæsthetic in a 10 per cent. freshly prepared aqueous solution. As HEXANASTAB-ORAL it is presented in four-grain tablets for oral administration. The advantages claimed for this substance are safe and quick-acting hypnosis, rapid excretion and freedom from habit-formation.

FLAVOTAN.—This is a sterilised non-greasy tannic-acid jelly containing acriflavine and amyl-metacresol. It is manufactured by Messrs. Boots and is supplied in collapsible tubes handy for use in the treatment of burns and scalds.

EPTOIN.—This is the brand name of an odourless, white powder with a bitter taste which is a preparation of sodium 5 : 5 diphenyl-hydantoin, a derivative of glycolyl urea, analogous in structure to the barbiturates. It is supplied by Messrs. Boots in capsules containing gr. 1½. It is said that the action of Eptoin is especially noticeable in epileptic patients who have been receiving large doses of barbiturates or bromides, for while controlling the fits it removes the depressant effect of large doses of sedatives.

SONERYL.—Pharmaceutical Specialties (May & Baker) Ltd., Dagenham, have introduced suppositories containing gr. 10 of Soneryl in addition to the gr. 3 suppositories previously made. Soneryl is also available as Soneryl Sodium in soluble form.

HEXOBARBITONE.—Burroughs Wellcome & Co. have added to their range of products Tabloid Hexobarbitone, each unit containing gr. 4 of N-methyl-cyclohexenylmethylbarbituric acid, to be administered orally to produce light hypnosis. The company are also presenting the sodium salt of this compound as Soluble Hexobarbitone in phials of 0·5 g. and 1 g., each phial being accompanied by a Hypoloid ampoule containing sufficient sterile distilled water to prepare a 10 per cent. solution of

Hypoloid soluble hexobarbitone for intravenous injection for minor surgery or for the induction of general anæsthesia in operations of not more than 20 to 30 minutes duration.

AMINOPHYLLINE.—This recent addition to the range of products of Burroughs Wellcome and Co. is a combination of theophylline with ethylenediamine. The diuretic action of theophylline is quickened by the greater solubility conferred by the ethylenediamine component, which also renders aminophylline suitable for parenteral administration. Aminophylline is available for oral administration in tabloid form, each unit containing 0·1 g. of the compound, and for parenteral administration as Hypoloid Aminophylline in ampoules containing a sterile solution in strengths of 0·5 g. in 2 c.cm. for intramuscular injection and 0·25 g. in 10 c.cm. for intravenous injection.

"HYPOLOID" MERSALYL.—This newly introduced product of Burroughs Wellcome and Co. provides a convenient means of administering by intravenous and intramuscular injection the complex mercurial compound described in the B.P. addendum 1936. The new product is a 10 per cent. solution of the sodium salt of salicyl-(γ-hydroxymercuri-β-methoxypropyl)-amide-*O*-acetic acid, with 5 per cent. theophylline added to inhibit the decomposition of the mercurial complex and increase its diuretic action. The product is presented in hypoloid ampoules of 1 c.cm. (in boxes of 10) and 2 c.cm. (in boxes of 5). It is said that the diuretic effect is enhanced if a mild acidosis is first produced by the administration of gr. 30 of ammonium chloride by mouth three times daily for two or three days prior to the injections.

DEROBIN.—Under this title Glaxo Laboratories Ltd. (Greenford) are making di-oxy-anthranol, formerly called Cignolin. This chemical compound is used in the treatment of psoriasis and many other common skin affections, including fungoid diseases.

Messrs. ALLEN & HANBURYS have sent us the latest edition of "Wise Babycraft," their book on infant feeding and management. Its four sections are on the expectant mother; the infant; the weanling and toddler; and minor ailments. The mother will find in its pages advice which is no less valuable because it is not impartial. Copies may be had on application.

AN EARLY FOOD REFORMER

ACCORDING to an anonymous writer in the "Lives of British Physicians," published in 1857, William Lambe was "eccentric in his manners and a rigid vegetarian." But as Mr. Saxe Wyndham shows in a brief memoir (London Vegetarian Society. Pp. 35. 6*d*.) he had much more to recommend him to the notice both of his contemporaries and of our generation. He was a pioneer in the doctrine that many diseases are the result of errors in diet and even more to impurities in drinking-water. He himself drank only distilled water and also banished from his table all nitrogenous material, even using milk and butter as sparingly as he could. Again, he was one of the first to recognise the merits of the waters of Leamington Spa, and to his efforts and the clinical reputation of Dr. Jephson was due the astonishing rise to popularity of that resort. In a few years it was changed from a small village to a fashionable and populous town. In addition—and probably this is the chief feature of Mr. Wyndham's pamphlet—Lambe was the friend of Shelley for many years and it was Lambe's fiat which sent Keats from the mortal rigours of an English winter only to die in Italy. Mr. Wyndham has added a good deal to our knowledge of these interesting relationships, and has followed the various families with which Lambe and his children were connected—Newtons, de Boinvilles, Aymards and Forsters—few of whom remained faithful for long to the vegetarian creed of the "Patriarch," as he became known in his intimate circle. Lambe himself was a rigid adherent to his tenets for almost half a century, but he did not apparently enforce his rules on his patients, to many of whom his services were rendered without a fee. At the Royal College of Physicians he was loved and honoured. "Farewell," said Francis Hawkins in a Harveian oration, "farewell, gentle spirit: for none more sincere or more innocent ever joined the Great Majority."

Medical Diary

Week beginning June 3

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1.

TUESDAY—5.30 P.M., general meeting of fellows.
Orthopædics—4.30 P.M., cases will be shown.
Surgery—6 P.M., annual general meeting.
WEDNESDAY
History of Medicine—5 P.M., Dr. H. P. Bayon: (1) The Masters of Salerno and the Origin of the Medical Profession in Western Europe. (2) The Medical and Alkemikal Writings attributed to Queen Cleopatra.
FRIDAY
Clinical—2.15 P.M., annual general meeting.
Medicine—3.30 P.M., annual general meeting.

ROYAL INSTITUTION, 21, Albemarle Street, W.1.

TUESDAY—5.15 P.M., Dr. J. C. Spence: Feeding of Children.

HARVEIAN SOCIETY OF LONDON

WEDNESDAY—3 P.M. (26, Portland Place, W.1), Dr. Arthur Morris: Hospital Administration. (Harveian lecture.)

BIOCHEMICAL SOCIETY

SATURDAY—2.30 P.M. (department of medical chemistry, University of Edinburgh), short communications and demonstrations.

EUGENICS SOCIETY

MONDAY—4.30 P.M. (rooms of the Linnean Society, Burlington House, Piccadilly, W.1), Sir Bruce Bruce-Porter: The Importance of the Child.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.

MONDAY—10 A.M., opening of special course on fractures.
TUESDAY—2.30 P.M., Sir Walter Langdon-Brown: ward clinic.
WEDNESDAY—11.30 A.M., Clinico-pathological conference—medical. 2 P.M., Dr. Janet Vaughan: Pregnancy Diagnosis Tests. 3 P.M., clinico-pathological conference—surgical. 4.30 P.M., Prof. G. R. Cameron: Pathology of the Liver.
THURSDAY—2 P.M., Dr. Duncan White: radiological conference.
FRIDAY—2 P.M., clinico-pathological conference—gynæcological. 2.30 P.M., Mr. V. B. Green-Armytage: sterility clinic.
DAILY.—10 A.M.–4 P.M., medical clinics; surgical clinics and operations; obstetrical and gynæcological clincs and operations; 1.30–2 P.M., post-mortem demonstration.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.

London Chest Hospital, Victoria Park, E.2. MON. AND FRI., 6 P.M., M.R.C.P. course in heart and lung diseases.—West End Hospital for Nervous Diseases, Gloucester Gate, N.W.1. MON. to FRI., M.R.C.P. afternoon course in neurology.—Brompton Hospital, S.W.3. WED. and THURS., M.R.C.P. course in chest diseases.

". . . One occasionally hears the statement that the trend of intellectual leadership is westward across the Atlantic. In proof of the assertion specific fields are mentioned, such as neurosurgery, astronomy, dentistry and perhaps orthopedics, in which America has won pre-eminent standing. But this argument overlooks the many fields in which leadership, certainly until the war began, was still in Europe and the many others in which genius and stimulation are as potent on one side of the ocean as on the other. In physiology, for example, it would be difficult to determine whether the leadership lies in Europe or in the United States. The same is true of anatomy and pathology. In fields like pharmacology, tropical medicine, ophthalmology, legal medicine, social medicine and dermatology—to mention only a few—leadership is unquestionably still in Europe, or was in 1939. In mathematics, the English are indisputably pre-eminent in analytic number theory; the Russians are making important contributions in topology and probability, the French in algebra. America cannot match the group of European scientists in the important fields of enzyme chemistry and the organic chemistry of natural products. Nowhere else in the world can one duplicate or even approach the coordinated and cooperating Scandinavian group which is focusing so many precise techniques of chemistry and physics on problems of biology."—RAYMOND B. FOSDICK in his review of the work of the Rockefeller Foundation for 1939.